The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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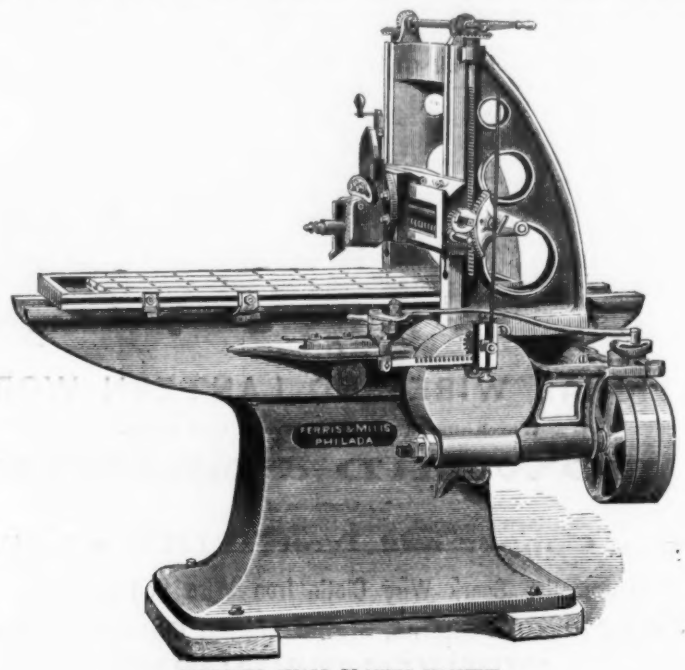
Improved Small Planing Machine.

As a handy machine, combining many of the advantages of the planer and shaper, we call attention to a small 17-inch planing machine recently introduced by Mesrrs. Ferris & Miles, 24th and Wood streets, Philadelphia. It will plane 17 inches square and 42 inches long, and the stroke can be reduced to almost nothing. It is very reliable in always stopping at the same point, which is a valuable feature in cutting key-seats, &c. The rack and all the gears are carefully cut, enabling the machine to plane very smooth. The gear guard, seen in the illustration, protects a worm wheel driven by a worm on the pulley shaft. This insures economy of power, noiselessness of action, and prevents much of the jar of the reverse. The feed gear is positive, being a rack and pinion motion driven directly by a lever and the dogs on the table, and is readily graduated by a screw and thumb nut to twentieths of an inch. It is self-acting in all directions, horizontal, vertical and angular, and will take cuts (automatically) sufficiently wide to give a good finish. It is said to be the only very small planing machine with automatic angular and vertical feed motions.



IMPROVED SMALL PLANING MACHINE.

The belt shifter and feed levers are independent of each other and can be instantly thrown out so as to clear the dogs and allow the table to run backward or forward to the limit of its traverse, for the temporary examination or resetting of work, or for reaching small spots not within the limits of travel, fixed by the position of the dogs. The quick return motion is obtained by using open and cross belts from the countershaft, and using a larger pulley for the return belt, thus saving extra gearing to accomplish the same purpose. The machines are all furnished with an original device for holding the work which is less expensive than the ordinary vise. Wrenches, countershaft and all necessary fittings are furnished with each machine.

Wood's Improved Piston.

We illustrate herewith a universal expanding device for the pistons of steam engines, which is capable of expanding the packing rings equally with a positive motion, so that, while the piston can be adjusted as desired, it acts, while working, like a solid piston; while, therefore, it can be regulated so as to take up the usual wear, it will not accommodate itself to the inequalities of the cylinder, nor wear more in one place than in another. A further advantage offered, as will be seen from the following description, is that the necessity of removing the follower in order to adjust the packing, is obviated: At A are the followers, which slide in suitable ways in the piston head. B is a central core or cylinder, which is bored out conically, as indicated by the dotted lines, and which is provided with a conical plug, C, which is forced in by the screw, D. The core is made in segments, held together by circular springs (E) placed in grooves on its exterior. The followers abut upon this core, and also have feet which press against the packing rings, so that when the plug (C) is forced in by the screw driver, the core is expanded and the followers, driven outward, produce a uniform expansion of the rings. The piston rod, instead of passing through the head, is secured into a boss cast on one side of the head, and the plug (C) may be easily removed when desired. In cases where "springs" are preferred they can be used in this piston, and adjusted by means of the radial arms in the same manner.

Many prefer a "solid piston," which should, when in use, wear the cylinder perfectly straight instead of larger in the middle, as is almost invariably the case where springs are used on pistons of a different construction than this. Should the piston of a horizontal cylinder from any cause wear down the center of the cylinder, it can be easily overcome in this piston by raising the follower-head by a small wedge, and while so raised move the set-screw, which will cause the packing rings to take up the deflection or lost motion, thereby raising the follower clear of the cylinder and relieving the wedge. With this piston no increased labor should be required to adjust the packing to cylinders of larger size. In all cases it requires the movement of but one screw, by which the packing can be adjusted to a nicety.

Engineers or machinists who have had experience know the great annoyance, trouble and time required to remove the follower from a piston, in order to set out the packing. Sometimes hours are consumed in moving the follower bolts, and in many cases they are twisted off, &c.; and after this is done the setting out of springs and using of lines is a great source of trouble, besides it being impossible to obtain a square pressure on all parts of the cylinder. With this piston all the above trouble and annoyance are claimed to be obviated. After the cylinder head is off, all that is required is to move the single set-screw, which gives a positive motion to the radial arms, be they few or many, and the packing is bound to expand to the extent required. There is no possibility of anything getting out of order, as every part of its construction is plain, simple and strong.

After a thorough trial in cylinders from 8 to 30 inches diameter, this piston has been pronounced by some of the best mechanical experts and engineers in the country to be superior to anything of the kind now in use for several reasons: 1. Because the packing is under the absolute control of the engineer, and can be so easily adjusted to suit every condition and circumstance required. 2. Being very economical in the use of steam and thereby saving fuel. 3. It is impossible to cut the cylinder (by setting out the packing too tight) where ordinary care is exercised, as the pressure of the rings on the cylinder is equally distributed.

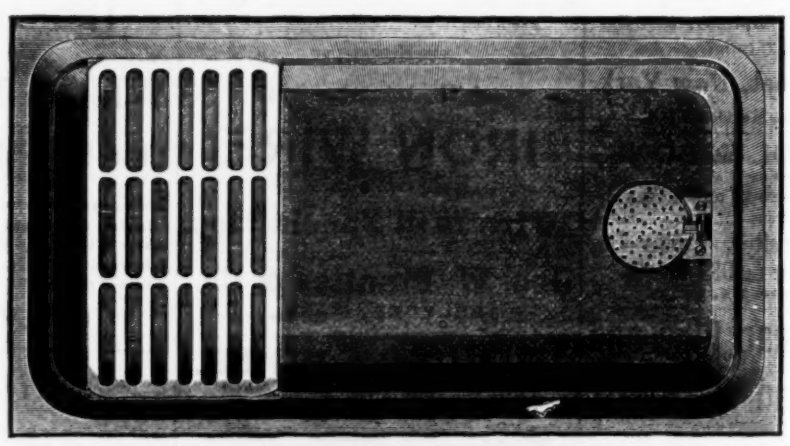
Messrs. John Wood, Jr., & Co., Conshohocken, near Philadelphia, are the patentees and manufacturers.

American and English Mechanics.—Mr. M. D. Conway, in a letter from London to the Cincinnati *Inquirer*, says: Just now we are treated with some very interesting treatises by prominent men on the relative abilities of American and English mechanics. Mr. Thomas Brassey, M. P., a strong-minded man who well thinks out his subjects, says, on the comparative efficiency of English and foreign labor, that the apprehension with which British competition was regarded was clearly indicated by the protective policy which every manufacturing country still maintained. In this the United States of America were far more stringent than any other country. In America the cost of labor had stimulated the ingenuity of inventors, and by labor-saving machinery they had been able to successfully compete with Great Britain in her own special manufactures, supplying rifles to the Turks, locomotives to South America and the British colonies. The American mechanics worked longer, more faithfully, honestly and industriously than the English; and if English mechanics did not reflect, British industry would shrink away before the free and vigorous efforts of the Americans. Goldwin Smith, however, in his treatise says that the English mechanics, as a class of workers, will ere long assume a newer and better position before the industrial world, and defy all competition of America by their superior opportunities in taste and refined workmanship. While I can indorse Mr. Brassey, I must take exception to Goldwin Smith. I take the lessons of the past in England and in America, and I compare the lessons of the present and draw my conclusions of the future.

Improved Cast Iron Sink.

The Magee Furnace Company, Boston, Massachusetts, are introducing an improved kitchen sink, which has many points of special merit. Sink Strainers, as usually arranged, while fairly effective when in place, are not altogether satisfactory. When the bell trap is used careless servants are very apt to remove it in order to facilitate the outflow, thus leaving a way open for the escape of cesspool or sewer gases, and in addition to the evil consequences thus invited, rendering it possible to choke the waste by means of solid matter which was never intended to pass into it. In the Magee sink care is taken to guard against the possibility of such carelessness or accident. The trap is immovable, being held in position by two brass screws. Whenever the waste requires cleaning, the strainer, which is hinged on brass pins, can be raised without disturbing the trap, and the entire waste readily and thoroughly cleansed.

In addition to this improved strainer trap, the sink is provided with a shelf for the purpose of holding a rack for draining dishes, &c., after washing; also a rack made of galvanized iron or of wood for this purpose, when desired. The Magee sink is of extra capacity, a 3 feet sink measuring 36 inches in length, 20 inches in width and 4¾ inches in depth; a 3½ feet, 42 long, 22 wide, 5¾ deep; other sizes in proportion. The corners are square, enabling the carpenter to set them with very little labor. The castings are very smooth, with the same surface and made from the same iron as the Magee stoves and ranges, which is a sufficient guaranty of excellence. The company also manufacture sinks of the common pattern.

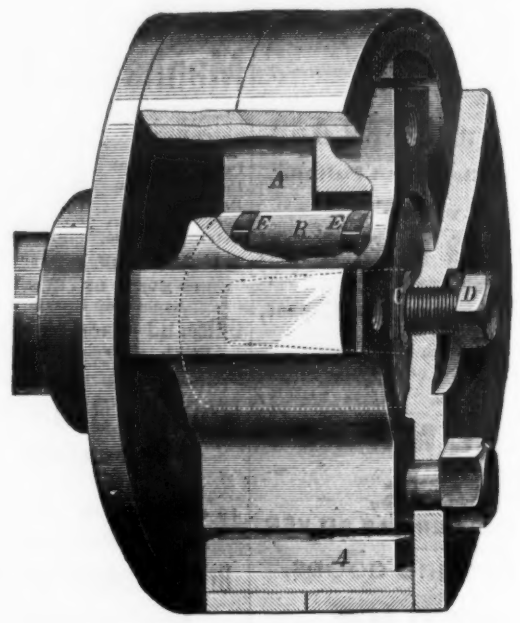


THE MAGEE CAST-IRON KITCHEN SINK.

Scenes and Incidents in the Upper Oil Region.

A new narrow-gauge railroad from Olean to Bradford, in what is known as the upper oil country of Pennsylvania, was opened on the 11th instant. The line is 23 miles long, with numerous curves, some of them on trestle work, and steep grades. The line is gouged out of the steep hillside, and is curved around the head of every gulley that it meets. All gullies are crossed on trestles. In many places the road turns upon itself till it forms a complete horseshoe—noticeably at Red Rock, where they call it the "zebra shoe." Here the distance gained is 1300 feet, and the distance traveled to gain it is 8200 feet. The curves here have a radius of about 190 feet; at one point the engineers appear to have made a reverse curve to get round a stump. The road was built in ninety days, and is only partially blasted. At one point the track climbs for four miles 135 feet to the mile. When one considers that this climb is made on a side hill, standing at an angle of 45 degrees, and much of it made on curved trestle that looked like matchwood, one can form some notion of the enterprise. The railroad track, seen from the rear platform, looked like a sled track in the mountains, and is as crooked as an exaggerated letter S.

Along the line oil derricks are very numerous. Land purchased by the old settlers for lumbering purposes at $10 an acre, is now paying rental of $200 a year for each acre in many cases. The land, in nearly all cases, is leased by "operators" from the owners. The average yield of the wells on the territory through which the narrow gauge railroad runs may be set down at ten barrels a day for each well. These wells were in all cases beretofore pumped twice a day, and the oil taken out to within 20 feet of the oil-bearing rock or the "sand," as it is called here. Recently the owners have adopted a process called "packing," which is putting a thick rubber band around the tubing just above the sand rock, and then driving the tubing funnel, pointed at its lower end, into this rubber in such a manner as to expand it against the sides of the drill hole so as to prevent the escape of the gas, which is found combined with the oil in the "third sand rock." The gas that has heretofore escaped around the 2-inch pumping tube that stood upright in the drill hole, that is 5½ inches in diameter, is now confined and must escape through the pumping tube. This makes the well what is here called a flowing well, and enables the operator to take away for other use his pumping engine, and utilize it in drilling another well.



WOOD'S EXPANDING PISTON.

The "plant," liberated by the conversion of a pumping into a flowing well, is worth $1200 (no small item here). The wells thus converted need no attention whatever, but flow into wooden tanks holding about 250 barrels each. Some of them cut up queer antics, and stop flowing for two or three days, then recommence, and in a day make up their average daily quantity.

The first wells in this section were put down in 1865 by Mr. Job Moses of Limestone. When first struck they gave about 12 or 14 barrels a day each. They are now yielding about five. There have been a few wells struck here that gave a great yield of shale or an inferior oil. These ran only for a short time, and produced 90 to 100 barrels a day, accompanied by much gas. After the shale oil gave out they were bored deeper into the sand rock, and were generally fair wells.

There is usually gas enough struck in the first well to drill the next. It is sometimes taken half a mile to the boiler at the second well. It makes a first-class steam generating fuel. Sometimes it is struck at the top of the second sand rock. In this case the drilling needed to complete the well and all subsequent pumping is done by its use as fuel. This town is lighted with gas procured from a well in its center. Great torchlights of it are burning on the street corners, while on the mountain side beacons are flaming everywhere. Stoves are set up beside many wells, it serving for fuel. In one hotel I saw it being burned in an ordinary base-burning stove. It is proposed to lay pipes and furnish houses with both fuel and light at a very low rate.

They have a speedy method of house building here. First they plant 8x8 pieces of hemlock in the ground, and saw them off to a level. On these they erect what is called a "balloon frame," and cover it outside with two thicknesses of pine boards; those on the side next the streets are planed. The partitions are made of two-inch plank, which is covered with cheap muslin, on which wall paper is pasted. A large house can be built in two weeks. A hotel containing 52 rooms was completed and occupied in two months.

Steel Ships.

The *Iron Trades Review* says: Messrs. C. Mitchell & Co. have now launched a steel screw steamer which they have had in construction in their building yard on the Tyne. Some years ago this firm used steel very extensively in the construction of vessels, and the steamer Ethel, just launched, is the eighteenth steel ship they have constructed. The Ethel represents in a decided manner the advantages which result from the employment of steel as shipbuilding material, and a contemporary says the shipping interest is indebted to the enterprise of Messrs. Henry Clapham & Co., of Newcastle, for thus practically carrying out a principle which has long been accepted as a scientific truth. Mr. Clapham, being fully impressed with the importance of the subject has, by great personal exertion, succeeded in enlisting the sympathies of the steel manufacturer, the shipbuilder, and Lloyd's Committee of Classification, regarding steel as a proper material for shipbuilding wherever a combination of strength and lightness becomes of special importance. Messrs. H. Clapham & Co. are largely engaged in the Bilbao iron ore trade, one of the elements of which is the shallowness of the water over the bar, and every inch that can be saved on a vessel's draft of water is of much consequence. For this reason the Ethel has been specially constructed for the ore trade, and built of steel. On the same draft of water as an iron ship of like size, she will carry upward of 80 tons additional cargo. This quantity, multiplied by the number of cargoes carried in 12 months, represents a very important addition to the steamer's annual income. The machinery for the Ethel is on the compound surface-condensing principle, and has been manufactured by the Wallsend Slipway Company. The boilers, like the hull of the vessel, are made entirely of steel. In the early days of steam shipbuilding, Messrs Mitchell & Co. experienced great difficulty in obtaining steel of a sufficiently uniform quality and strength; but since Dr. Siemens has introduced the special mode of steel manufacture known as the "Siemens process," a material of wonderful equal quality can be obtained, and at a price sufficiently moderate to bring it within practical range as a shipbuilding material. The question of classing vessels built of steel has also been satisfactorily settled. Lloyd's committee, with their usual prudence, declined to permit steel to be used of less thickness than iron until they had convincing proofs of its uniformly superior strength. A special committee of Lloyd's was recently appointed to investigate this subject, and after a most exhaustive series of experiments had been made, steel has been regularly adopted in Lloyd's, and a reduction in scantling allowed in proportion to its greater strength.

In the hardware and cutlery industries of Sheffield business is slack, though there is a slight increase in activity in some departments. In the present uncertain state of political affairs no improvement is expected. The tool trades are more active

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SEE PAGE 9.

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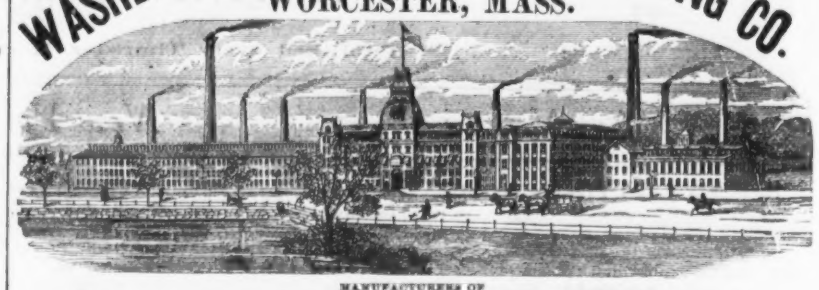

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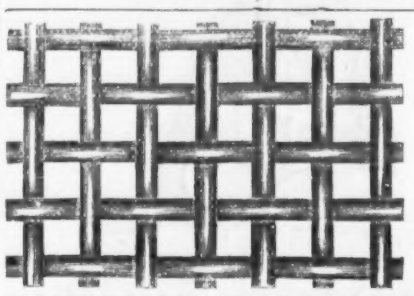

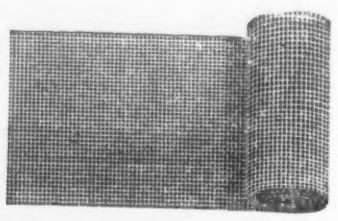

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American vs. English Manufactures.

We take the following from an important article in the *Mercantile Shipping Register and Commercial Gazette*, published in London, Livepool and Glasgow:

It is somewhat remarkable that in the outcry that is being raised about the decline of the English trade, and the disastrous effects of protective duties abroad and labor disputes at home, so little has been said about the extremely rapid growth of the American export trade. We hear plenty about the prohibitive duties of Russia, and the iron works of Belgium—which latter indeed are formidable rivals, as is proved by the immense quantity of their manufactures which has lately been used in England, notably at the Natural History Museum at South Kensington, perhaps the largest architectural work on which we are now employed—but comparatively little about the most important of all the causes which threaten to curtail our ancient commercial monopoly, the extraordinary development within the last few years of the American export trade. The introduction of all kinds of goods from that country into Great Britain and her colonies has now become a matter of the most vital importance to our manufacturers; American exports too are still in their infancy, and yet we cannot say that they have not established a firm footing. They have indeed done so, and already many branches of our commerce are beginning to suffer from the competition. A transatlantic commercial journal in writing upon the subject of American manufacturing and export trade confesses, in so many words, that the object of American internal policy for the past 20 years has been, first to secure the home supply of all their necessities and to exclude Great Britain from their markets; next, when that first object was attained to extend their own operations so as to shoulder out England from the foreign and colonial markets which she had so long considered as her own. In the first of these objects success was by no means easy. English interests were very firmly seated in America and very heavy protective duties had to be imposed. Gradually a generation of competent native or immigrant workmen and mechanics sprang up, many of the best hands coming from England, induced by the high wages paid during the war. Finally a great many branches of English import trade were destroyed. The crisis of 1873, which is not yet indeed over, curtailed home consumption to a considerable extent, but at the same time it did something toward enabling manufacturers to get a footing in foreign and colonial markets, by causing a fall in the former excessive rate of wages, until they approached somewhat nearer to a European standard, by cheapening raw material, by stimulating the introduction of machinery, and by creating an absolute necessity for some relief to overburden home markets. During the last two years the influx of American goods not only into these islands, but into our colonies, into India, into Japan and even into the close markets of Continental Europe, has swelled at an extraordinary and alarming rate. We have heard in recent years a great deal about the loss caused to England by the protective duties of the Continent, we have indicated above that there is some ground for the apprehension which our ironmasters and manufacturers feel in consequence of Belgium competition, we have heard the boasts of the Germans that analysis has proved that their vast coal fields of Westphalia afford a superior fuel to that which we can supply, and yet we make bold to say that not all these facts put together give nearly so great a cause for anxiety as the terribly energetic proceedings of our American cousins. The industries which chiefly feel the weight of their competition are as yet mainly to be found among those comparatively small and isolated trades of which not much is heard by the general public, although in their total sum they provide daily bread for enormous numbers of our population. Spread over the face of Great Britain, but more especially in England, numberless minor industries subsist, either collected into towns or particular districts, such for instance as the lock trade of Willenhall, or carried on in isolated and arbitrarily located factories and workshops, or even in the cottages of the poor. In this country these trades are carried on for the most part by small capitalists with but little scope, without in fact the largeness of method and vigor of enterprise which are so characteristic of America. The products of these trades are now beginning steadily to retreat before the flood of similar and in many cases superior articles which are flowing in ever-increasing volume from the United States. The lock trade we have mentioned. During the last week we have had the opportunity of examining several kinds of cheap locks, samples of the work turned out over the water to supply the English demand. On seeing these articles we were compelled to acknowledge to ourselves that, if English manufacturers do not entirely change their mode of proceeding, that particular trade will be surely and rapidly annihilated. The cheapest and commonest of these locks are neat and compact, with excellent keys, strong, lively in action and altogether expressive of thoroughness in manufacture, and yet in price they can compete successfully with the commonest and roughest of our own productions. To take the case of another small article of trade—hammers. We have persisted in using a stupid and inconvenint form of these implements, neglecting any attempts on the part of our own manufacturers to introduce a better shape and material, till now cast-steel hammers from the States are coming into very general use and rapidly superseding the obsolete weapon to which we clung with such insular obstinacy. The king of English wood cutters, Mr. Gladstone, has borne witness to the excellence of American axes, whose form and fittings have been very generally imitated by our own manufacturers. That we should be excelled in that particular article, however, may not be thought surprising, seeing how much more the ax is used in the States than in our highly cultivated island. We have found it very difficult, almost impossible in fact, to obtain any trustworthy and detailed statistics of the trade in American import goods, owing to the reluctance of American merchants and their agents to say or do anything to call the attention of possible rivals to the famous trade which they are doing in the Old World and its colonies. This dislike to publicity we have found to be universally felt by those who are best able to give information. As we have said, it is the best possible proof that they could say a very great deal if they chose. The most casual observers cannot have escaped seeing the names of several American firms and joint stock companies for the manufacture of watches and clocks. American clocks have long been a favorite domestic article with our middle classes, and now American watches are coming into equal favor. The clocks which our rivals are now sending over are a very superior article to what they used to send us, and bid fair to become popular with all classes. They are staring from the windows of innumerable shops all over London, and their price is absurdly low when compared with goods of an equal class of our own manufacture. With regard to American watches, the best known, perhaps, are those manufactured at Waltham in Massachusetts, and are called the Waltham watches. The Americans claim for their watches extreme simplicity of construction, and the production of a perfect timekeeper at a price that puts it within the reach of all. Each separate part is made by machinery, and the machines which are used are said to be marvels of ingenuity, delicacy and exactitude, thus the watches—as a whole—are more certain in point of quality than those produced by disconnected labor, as in the case of English and Swiss productions. The factory at Waltham covers three acres of ground, employs more than 1000 operatives and produces 350 watches per day, while the total number produced by this company since its formation exceeds 1,000,000.

As for American piano-fortes, Steinway's have now become well known over both worlds. To go from great things to small, we have just been shown a little article which exemplifies the American readiness to seize opportunities for improvement, however small. A vise in which, instead of the old-fashioned single jaw with a smooth or rough hold as the case might require, we have two pairs of jaws, one above, the other below; one smooth, the other rough, so that any description of work could be held by it; it also revolves on its axis so that the work could be arranged at any convenient angle. This is but a slight thing, but it is characteristic. This want of readiness in us to adopt improvement is one great cause of our failure to keep our start; another cause is to be found in our inadequate powers of organization, in the predominence of small firms with insufficient capital, and the consequently narrow scope of their operations; another and a final cause, though one which we hope is gradually diminishing, is our disregard of the attractions given to every manufactured article, no matter how utilitarian in object, by beauty of design. We have always been too fond of talking with exaggerated praise of our superiority in workmanship, and our deficiency in art qualities, but we must now do all we know to prevent the first of these statements from becoming an empty boast, and the second becoming true. The Americans deserve all the success they have achieved, and we must make it serve as a lesson to us, so that we in turn may make a spurt in the race. The universal law of progress seems to be a series of alternate periods of energy and reaction, and possibly in the future the trade relations between the old world and the new may go on the lines laid down by such a law. The only regret which the lover of universal progress may legitimately feel is that the Americans should ever have embarked on a system of protection, that is, a system of artificially forcing unnecessary branches of trade, instead of devoting the whole of their energies to the opening up and development of their unequaled agricultural pastoral and mineral resources. When they had been all brought into complete working order, to supply not only the home population but one bearing some proportion to the amount of land in the country, then would have been the time to go in for cotton mills and other branches of town industry. However, they wanted industries, and now they have got them; they aspired to cut out the old country, they bid fair to satisfy that wish also, and long before those who are now middle aged become old, we shall probably find England a national agent for American goods, if we have not arrived at something bordering on that already; not in all things, but in American novelties, judging from the number of shops which deal in such articles, and who announce the fact in their windows. This shows that our dealers are not deficient in enterprise; it is our manufacturers who lack that quality.

The following are among the articles which America is manufacturing for export: Hardware sundries too numerous to mention; machinery of all kinds; steam engines and boilers; steam pumps; coffe, sugar and general plantation machinery; agricultural implements; wood-working machinery for carriage builders, joiners and cabinet makers; confectioners' tools; scales and weighing machines; chandeliers; gas and oil fittings; bronze ornaments; china and porcelain furniture, and hardware trimmings; stationers' sundries, including pencil cases; shovels, axes, edge tools and hammers; cutlery; electro plates; cooking and heating stoves; furniture; clocks and watches; pianofortes and organs; domestic machinery; bird cages; school furniture; steel pens; optical instruments; nails; glassware; trunks and portmanteaus, railway cars, carriage lamps, &c. Most of these articles are in many respects superior to our own productions; ingenuity in design, excellent material and workmanship, and superior finish characterize them throughout.

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The Founding of Alloys.*

BY EDWARD KIRK.

I

The term alloy means a compound of two or more metals, but when one of the metals entering into the compound is mercury, the compound is then termed an amalgam. The founding of alloy seems to be older than the founding of iron; for although we read in the Scriptures of iron and brass, yet we do not find any account of the founding of iron, while we do find accounts of the founding of alloys, both in the Scriptures and ancient history. In the description of Solomon's temple, in the Scriptures, we find that all the pillars, chapiters, wreaths, panels, bases, and the twelve oxen and the bason or sea that set upon the twelve oxen, were all made of bright brass; and all the vessels for the temple were made in such great abundance that the weight of them could not be found out; and all these castings for the temple were cast by Hiram, in the plain of Jordan, in the clay ground. From this description it would seem that these castings were made either in green sand or loam, and it is probable that the processes of moulding them were the same as the processes of moulding in use at the present time. At the time of the building of the temple by Solomon, the Israelites do not seem to have understood the founding of alloys to the same perfection as the other nations around them; for when about to build the temple, Solomon sent to Hiram, King of Tyre, to send him a man cunning in the working of brass; and in one part of the Scripture it is recorded that the King of Tyre sent him a man who was a widow's son, of the tribe of Naphtali, and his father was a man of Tyre and a worker in brass. And in another part of the Scriptures it is recorded that he sent him the son of a woman of the daughters of Dan, and his father was a man of Tyre, skillful to work in gold, silver, brass, iron, &c. Whether the King of Tyre sent Solomon any more men to do the work in brass is not stated; but as was customary in those days, Hiram, the King of Tyre, seems to have gotten all the credit for doing the work.

The founding of alloys seems to have been brought to great perfection by almost all of the ancient nations, for all their implements of war, such as the sword, spears, shields, &c., were made of bronze, and all their tools, ornaments, &c., seem to have been made of alloys of different metals. Bright brass seems to have been a favorite metal in the days of Solomon, and it is probable that the ancients valued the bright and showy alloys more than the less showy metal, iron. The alloy bronze seems to have been used by all the ancient nations for weapons, shields, edged tools, &c. The ancients understood the art of hardening and tempering bronze to perfection, so that the want of steel was not so severely felt as we may be inclined to believe at the present time. The ancient Mexicans understood the art of converting bronze into edged instruments, in a high degree. The bronze of the ancient Greeks consisted chiefly of copper and tin, but some of their bronze instruments have been found that also contained gold, silver, lead, zinc and arsenic.

The ancients appear to have been acquainted with only seven metals; at the present time we are acquainted with fifty-one or fifty-two; yet the metals to which the application of useful metals most peculiarly belongs at the present time were most all known to the ancients. Only about 14 of those we know are used in the foundry of metals or in the useful arts of life. The majority of these 51 or 52 metals are merely chemical curiosities of no practical value whatever.

METALS AND RECIPES FOR ALLOYS.

Of all the known metals in use at the present time, iron and platinum are the only metals that bear welding and forging well, and iron or steel is the only metal that admits of being hardened beyond that degree which may be produced by simple mechanical means, such as hammering, rolling, &c. Yet all the metals, with the exception of platinum and its kindred metals, admit of ready fusion; and their fusibility offers an easy means of uniting them, and many of them combine with other metals with great readiness, and by mixing two or more of these metals by means of fusion, an alloy may be formed that is of an entirely different nature from any of its constituents, and by the process of founding alloys, may be cast into any desired form. The malleability and ductility of these metals, as well as their hardness and brittleness, is often increased by alloying with each other, and these qualities are often turned to many useful and varied purposes. The ready fusion of these metals also affords a ready means of uniting two or more metals by the fusion of a third metal by the process of soldering. Some of these metals will unite with others in almost any proportion, and forms a perfect chemical mixture which in many cases produces a superior metal to either of its constituents, while in others the chemical affinity is limited and they will only unite in certain proportions, and when mixed beyond these proportions the alloy is only a mechanical mixture and often forms an inferior metal to either of its constituents. I have given several recipes for the formation of alloys by mixing these different metals; but in using these or other recipes in forming alloys the founder must not be guided entirely by the recipe, but he should use his own judgment as well, for the metals may contain certain impurities, or, as it is termed, be a poor metal, which will produce different results; and in order to produce good alloys a long practical experience is as essential as good recipes, for a man who has not had practical experience in forming alloys can no more produce a perfect alloy from a recipe than a school boy can produce perfect writing from his first copy.

ALLOYS OF IRON.

All admixtures added to iron make it more fusible than when pure, although the admixtures added may not be a metal.

Lead can be alloyed with iron in small quantities. A small amount of lead causes iron to be soft and tough, but too much causes it to be extreme cold-short.

Copper, if alloyed with iron, causes it to be extreme red-short, and more than 1 per cent. of copper will cause it to be cold-short; but a small amount of copper will increase the strength of iron when cold.

Arsenic imparts a beautiful white color to iron, resembling silver, but it makes it very brittle.

Tin, when alloyed with iron, makes a beautiful fine white metal, and when the tin and iron is alloyed about half-and-half the alloy is as hard as steel, but it cannot be forged.

Chromium, alloyed with iron, makes an alloy that is as hard as diamond, but it is very difficult to make this alloy.

Silver, alloyed with iron in small quantities, causes the iron to be very hard and brittle, and very liable to corrode.

Gold can be alloyed with iron in any amount. It causes the iron to be more yellow and tough. This alloy is principally used as a solder for small iron castings.

Carbon makes iron more fusible. From 1 to 2 per cent. of carbon added to iron, makes hard cast iron, and from 5 to 6 per cent. makes No. 1 foundry iron. More than 5 or 6 per cent. of carbon causes iron to be very brittle, and less than 1 per cent. of carbon causes iron to be very hard and brittle.

Sulphur causes iron to be both hard and brittle, either when hot or cold, and it causes molten iron to be short-lived. Fuel with sulphur in it should not be used for melting iron in contact with the fuel.

Phosphorus is very injurious to iron. One-half of 1 per cent. will cause iron to be very hard and brittle when cold, but it imparts a brilliant and white color to iron more perfectly than any other metal.

Silicon makes iron brittle and hard. It has a similar effect on iron to phosphorus, but it is not near so injurious to the iron.

All cast iron contains more or less carbon, sulphur, phosphorus and silicon, and as these substances predominate they form hard or soft, strong or brittle irons; and as all anthracite coal and coke contain more or less of these substances, the anthracite or coke iron is less pure and more variable than the charcoal irons, and on account of the uncertainty of the amount of these impurities contained in cast iron, it is very difficult to make an alloy of iron and other metals with any certainty as to the result, and for this reason alloyed iron is very little used.

GERMAN SILVER ALLOYS.

German silver is composed of 80 parts copper, 20 parts nickel and 33½ parts zinc.

The best quality of German silver is composed of 100 parts copper, 50 parts nickel and 50 parts zinc.

The white copper, or packfong of the Chinese, which is the same as the German silver of the present day, is composed of 41 parts copper, 17 parts nickel, 13 parts zinc and 2½ parts iron.

A very hard German silver is made of 8 parts copper, 4 parts zinc, 2 parts nickel and 1 part iron. This alloy is very tenacious and ductile.

A still harder German silver is made of 16 parts copper, 8 parts zinc, 4 parts nickel and 3 parts iron.

The finest quality of German silver that is made is composed of 16 parts copper, 8 parts nickel and 7 parts zinc.

Ten parts copper shavings and 4 parts arsenic, arranged in a crucible in alternate layers, and covered with a layer of common salt, make a beautiful white alloy that is almost equal to silver. In making this alloy care must be taken to avoid the fumes of the arsenic.

BRASS ALLOYS.

A very good brass is made of 16 pounds of copper, 8 pounds of zinc and one one-half pound of lead. The lead should be added after the copper and zinc have been melted together. These proportions of the different metals make the best brass that can be made with zinc and copper. For very light castings the lead should be omitted, as it makes the alloy less fluid; but in heavy castings, it makes them more solid and clean.

Button brass consists of 24 parts copper to 15 parts zinc.

Red brass is made of 9 parts copper and 1 part zinc.

Red brass made at Hegermuhl consists of 5½ parts copper and 1 part zinc.

Brass that bears soldering well consists of 16 parts copper and 6 parts zinc.

Brass for ship nails consist of 20 parts copper, 16 parts zinc and 2 parts iron.

Red sheet brass is made of 9 parts copper and 2 parts zinc.

Brass for sheathing, bolts, fastenings, &c., is composed of 6 parts copper and 4 parts zinc. This composition forms an alloy that may be rolled and worked at a red heat.

Brass for pumps, and machinery requiring great tenacity, is made of 32 pounds copper, 3 pounds tin and 1 pound zinc.

Brass for gear wheels, to have teeth cut in them, is made of 32 pounds copper, 3 pounds tin and 2 pounds old brass. If it is desirable to have the wheels harder, a little more tin may be added.

An alloy for turned and finished work is made of 32 pounds copper, 4 pounds tin and 3 pounds old brass. For nuts of coarse thread, one-half pound more tin may be added.

As more tin is added to alloys of copper and zinc, or copper and old brass, the alloy becomes harder. Razors have been made of an alloy of 32 parts copper, five parts tin and 5 parts zinc.

The best white hard metal for buttons is made of 16 parts copper, 2 parts zinc and 1 part tin.

LEAD AND COPPER ALLOYS.

Seven parts lead and 16 parts copper makes a very cheap alloy, but it is rather short and easily broken.

Two parts lead and 8 parts copper makes a red-colored alloy that is very tough.

A red colored and ductile brass is made of 2 parts lead and 16 parts copper.

Ordinary pot metal is made of 6 parts lead and 16 parts copper. This alloy is very brittle when hot, but tough when cold. The alloys of copper and lead are all very brittle when hot. More than one-half pound of lead cannot be alloyed with one pound of copper, for the copper will not unite with the lead, and the lead will ooze out in cooling. Alloys of lead and copper are very little used.

Lead and copper alloys have a bluish, leaden hue when much lead is used, and are principally used on account of their cheapness.

BRONZE ALLOYS.

A bronze in imitation of gold may be made of 45.5 parts copper, 3.5 parts tin and 1 part zinc—50 parts.

Bronze metals are generally cast of an alloy of 50 parts copper and 2.8 parts tin. This alloy is very hard.

A softer bronze for medals than the above is composed of 46 parts copper and 4 parts tin.

Ancient bronze nails were made of 40 parts copper to 1 part tin, and were very flexible.

Soft bronze is composed of 18 pounds copper to 2 pounds tin.

Hard bronze is composed of 20 pounds copper to 5 pounds tin.

The ancient bronze mirrors are said to have contained 16 parts copper to from 7 to 8 parts tin.

At the time of Louis XIV of France, a period when the art of casting statues was much cultivated in France, statues were cast of an alloy of 30.6 parts copper, 0.11 parts tin, 2 parts zinc and 0.6 parts lead.

The statue of Louis XV is cast of 82.4 parts copper, 10.3 parts zinc, 4 parts tin and 3.2 parts lead.

The bronze of the ancient Greeks consisted chiefly of copper and tin, but was frequently alloyed with arsenic, zinc, gold, silver and lead. All their sheilds and weapons of war were made of bronze, as well as coin, nails, kitchen utensils, &c.

All the ancient nations seem to have understood the art of tempering bronze and copper, and the ancient Mexicans understood the art of converting bronze into edged instruments in a high degree, but the art of tempering and hardening bronze and copper has been lost to modern nations; but as we understand the working of iron better than the ancients, and have steel, an alloy of iron and carbon, which the ancients did not have, we do not miss this art much.

BELL-METAL ALLOYS.

One hundred and forty-four pounds copper, 53 pounds tin and 3 pounds iron, is said to make a superior bell. Iron, copper and tin do not unite well, if each is added separately to the other, but if tin-plate scraps are melted in a crucible together with tin, and then this tin and iron alloy added to the molten copper, it will unite readily.

Another alloy that is highly recommended is composed of 53.5 parts copper, 6.11 parts tin, 2.13 parts lead and 3.9 parts tin. This alloy has a good, sonorous sound, even if the mould is not thoroughly dry.

House bells are made of 4 pounds tin to 16 pounds copper.

Soft musical bells are made of 3 pounds tin to 16 pounds copper.

Common bell metal consists of 50 pounds copper to 15 or 20 pounds tin.

The silver bells of Rouen, France, consist of 40 pounds copper, 5 pounds tin, 3 pounds zinc and 2 pounds lead.

Too much tin causes bell metal to be brittle.

The gongs or cymbals and tam-tams of the Chinese are composed of 40 pounds copper to 10 pounds tin. To give these musical instruments their proper tone, they are plunged in cold water while hot, after being cast; cooling in water deprives the metal of almost all its sound. It is tempered and very slowly cooled, which imparts to it that peculiarly powerful sound.

If bell metal is suddenly cooled, it becomes less dense and hard, and is increased in malleability; but the tone of the metal is decidedly impaired, and bells ought never to be cast in damp moulds. When bells are cooled suddenly they should be reheated and tempered by cooling slowly.

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Metallic Freight Cars.—There are now in use on the Chicago, Burlington and Quincy Railroad some 20 box cars of the La Mothe pattern. At a distance they bear much resemblance to the ordinary wooden railroad car; but on approaching nearer the difference is at once discernible. The same trucks are used as on other cars, the manufacturers furnishing at present the car bodies alone, or mounted on such trucks as a railway company may desire. The bodies are made of boiler tubing and steel rods. The sills are of 2¾-inch tubing; the top framing of soft steel rods, united without joints or bolts, and forming a combination of strength and lightness. The box cars are covered with sheet iron, united by lap and groove (no rivets), and lined inside with a light felting of paper. The interior is lined with very thin light wood; the purpose of the paper and wood lining is to preserve an even temperature with the car, and it is claimed that these cars are thus rendered cooler in summer and warmer in winter than the ordinary box car. Externally the metallic box is neat in appearance—much more so than the wooden car. It is susceptible of any amount of ornamentation, and passenger cars built in this way can be made very handsome. The weight of the bodies of these cars is from 8200 to 8800 lbs. With the truck they weigh from 17,000 to 18,000 lbs.—nearer the former figure than the latter. The average weight of the wooden cars of the Chicago, Burlington and Quincy Railroad is 20,050 lbs. It should be noted that the newer cars, such as are now built entirely of wood, average over 21,000 lbs. As between them and the La Mothe cars there is therefore a difference of nearly 4000 lbs. in favor of the latter. In addition to the saving in dead weight, the metallic cars have a greater carrying capacity. The ordinary car load is 10 tons; the La Mothe cars will carry 15 tons easily without danger.

A lumberman's circular estimates that the railways of the United States consume annually about 150,000 acres of timber for ties, about 300,000 for the manufacture of rolling stock, and near 500,000 acres for fuel, making a total of 1,000,000 acres, or 1500 square miles of timber stripped off for the railway alone. These figures, which may not be far from correct, suggest the necessity of planting timber for ties or else looking for some other material for them ere long. Coal is rapidly replacing wood for fuel, and iron is being used more and more in the construction of buildings, bridges, cars, &c., but for all that, timber is certain to be very scarce some day unless systematic planting is soon undertaken.

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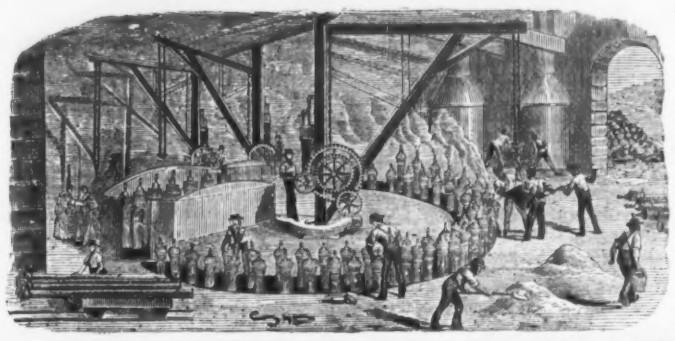

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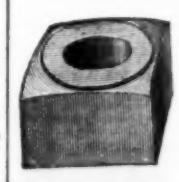

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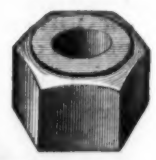

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Educating the Hands.

The subject of technical education, to which we have frequently referred, is at present justly receiving a large share of attention. At a recent meeting of the Board of Education of one of our Western cities, a modification of the course of studies in the High School in the direction of preparation for the higher walks of mechanical and engineering industry, was proposed, thus recognizing the importance of the subject.

This, however, if generally carried out, would be scarcely more than a recognition of the want, and would do little toward practically meeting it. The instruction, to be of real value, should be more strictly practical, and should begin at a much lower point. Technical education is not truly such unless the hands are educated as well as the head. Nor are we prepared to take the ground that such education can properly and legally be made a part of the school system supported by general taxation. That is a point of detail which can be settled when the people are awakened to the public necessity of such education being given a portion, at least, of the youth of school age. When that point is reached the question of ways and means will not long remain unsettled.

As a result of thorough study and investigation of the subject in countries where technical education is the rule, and in others, like England and the United States, where it is, unfortunately, the rare exception, the writer says it is not merely technical colleges of the higher class that are needed, although these are very essential. But, as in the "ambacht" schools of Holland, this country, as well as England, requires in each locality schools on moderate terms, available by all, where children of all classes may be taught various handicrafts and arts which will be most useful to them, whether they are afterward needed for a livelihood or not. Thousands of parents in all classes of life would be only too glad to have such local schools, where their children might be taught the practical use of at least the most common tools and instruments and the rudiments of general mechanical and other construction, and of some of the most necessary handicrafts. Such schools might probably be assisted in some way from the public funds, even if not regularly incorporated with the public school system. Even without this we have little doubt means could be found for their support in other ways. But in whichever way the support may be obtained, it is eminently desirable that, in some more common and extensive way than has hitherto obtained in this country, the education of the rising generation should become more industrial, more completely useful in its character, and more befitting a practical age.

In the London *Times* of August 29th we find a letter, bearing directly on the subject from Mr. William Tallack, a gentleman who has for years made the subjects of labor, education and crime his special study, and who in the course of his investigations made close examination of the technical schools in operation on the Continent of Europe, with the purpose of ascertaining the adaptability of their systems to the wants of Great Britain. Of late he has turned his attention particularly to the United States, studying the condition of labor, education and crime, with a view to determine, as far as possible, the bearing each has on the others. The communication was called out by many letters and communications received from this country, which strongly unite in the practical lesson for all countries, that however widely and cheaply a merely intellectual training may be diffused among a people, their youth can never become truly "educated so long as there are no adequate concurrent means for forming habits of manual industry and a disposition for honest self-support. In the view of the writer in the *Times*, foremost among the causes for the present general depression in this country and for the want of employment and consequent crime and violence recently manifested so extensively, must be considered the hindrances to future self-support placed in the way of American youth by a practical withholding of industrial training.

Corruption in Business.

The Leed's *Express*, in commenting on the prevailing corruption in business throughout Great Britain, says some things which may be read with advantage by American merchants. We quote as follows:

The newspaper press of England has from time to time furnished innumerable proofs of the vicious and objectionable practices indulged in by some of our manufacturers and merchants to attain what they look upon as successful positions in commerce. There is business and business. The commerce which indulges in practices which strongly smack of dishonorable conduct is as different as possible to that which attains success because of the integrity of its characteristics. While the first acquires capital and perhaps independence by an indulgence in a course of trade manipulation which is justly entitled to the most severe reprobation of the conscientious trader, the second obtains renown, character, and very often riches by the universal adoption of honorable dealing. While the one is possessed of the unenviable reputation of knowing and being fully alive to all the tricks of the trade, the other pursues an even line of conduct, and supplies his customers with goods of such an invariably high and meritorious character as to obtain for the house the widest possible renown for rectitude and business importance. The reason why there is such a manifest difference between these two hypothetical concerns is not difficult of elucidation. There has unfortunately come to the surface in recent years a system which, to call a spade a spade, is bribery in the fullest sense of the word. This it is that strikes at the root of that feeling of integrity which ought to be the distinguishing characteristic of our business men; and among the causes of the decadence in English manufacture from which our trade is now suffering, have been the bribery and kindred forms of a corrupting tendency, of which we have lately had so many knavish instances in our public records.

But this wholesale infraction of the rules which guide straightforward business houses is of necessity associated with scores of other instances of trade dishonesty. Adulteration, wrong description, inaccurate measurement, short weight and a hundred other informalities are to some extent mixed up with the practice. Then, too, the knowledge of the prevalence of tips almost of necessity cast around those who try to act with uprightness a distinct halo of suspicion, so that men of integrity are often and unjustly placed in the same category. Naturally the philanthropist inquires how such a state of affairs is to be remedied. No doubt the primary and most important consideration should be to instil into the minds of the rising generation ideas of integrity and system. Let them fully comprehend the truth of the well-worn axiom, "Honesty is the best policy," and that thorough consistency in business is of essential importance. But here crops up another view of the question. Is it a fact that some large and wealthy houses of business entrust extensive buying orders to persons whose incomes are far from commensurate with the importance of their position? It should never be forgotten that they are daily brought in contact with business people whose anxiety to obtain orders in so great as to induce them to frequently offer substantial gifts. Is the buyer in a sufficiently good position to enable him to withstand the wily tempter? This matter wants consideration, because, although no inadequacy of salary is the slightest justification for a departure from the path of honor, temptation should not be unguardedly thrown in the way of any one. If it does present itself, as it often will, a well-paid servant would be unapproachable. Houses of business should also make it distinctly understood that all accounts will be closed in the event of infractions of this proper rule in respect to *douceurs*.

Trial of Armor Plates.—The Sheffield *Independent*, in a recent issue, gives some interesting facts in regard to tests made of a compound iron and steel plate by John Brown & Co. on the system patented by Mr. Ellis. This plate has been tested by the War Department at Shoeburyness with excellent results. The plate measured 8 feet by 6 feet 6 inches, and was 9 inches thick, the steel face and iron back being equal in thickness. The plate was fired at under the ordinary conditions of test adopted by the war office, without any backing, with the 7-inch gun and a full charge of 30 pounds of powder. The first shot was fired at near the top edge, about equidistant from each side, and two subsequent ones lower down, within about 2 feet of the first. The average indentation was about 6 inches, the effect by the three shots on the back of the plate being only a slight crack made by the first shot, which was caused probably from its proximity to the edge of the plate. There were several fine cracks on the face, but none deeper than the thickness of the steel, and there was not even a sign of separation between the iron and the steel. To give an idea of the advantage of these compound plates, it must be understood that a similar shot against an iron plate would have produced double this penetration, that is to say, the shot would have penetrated the full thickness of the plate, and nearly to the extent of the bulge raised at the back, with considerable damage to the back of the plate. In a steel plate the same shots would have produced cracks the entire thickness, thus breaking up the plate. As only about one-fourth of the plate was experimented upon, it is intended to use it for further tests with a 9-inch gun.

Solidification of Gases.—Close upon the liquefaction of oxygen and hydrogen, comes the announcement that they have been solidified. The men who have achieved these triumphs are MM. Pictet, of Geneva, and Cailletet, of Paris; they are running a close race of discovery. M. Pictet, in a very recent experiment with hydrogen compressed at 650 atmospheres, found on opening the stop-cock that the gas issued with a noise like that of a hot iron bar under water, and it had a steel blue color. The jet suddenly became intermittent, and then there followed a sort of hail of the solid particles of hydrogen, which fell with violence on the ground and produced a crackling noise. Afterward the stop-cock was closed, and there was evidence that a crystallization of hydrogen took place within the tube; but when the temperature was again raised, the gas issued as a liquid. M. Dumas, the president of the French Academy of Sciences, accepts these facts as full confirmation of his theory, long ago advanced, that hydrogen is a gaseous metal. He now adds the statement that when a person drinks a glass of water, he imbibes a metallic oxide. *Nature*, in mentioning these astonishing performances, couples with them another, which it regards as yet more remarkable from a scientific point of view. M. Pictet has been able to measure, with a very close approach to accuracy, the volume occupied by a given weight of oxygen in the liquid state; this was found to agree with the volume calculated for the solid or liquid gas, on theoretic considerations, by M. Dumas. By means of two Nicol prisms, M. Pictet observed the jet of liquid oxygen in polarized light, and found strong evidence of the presence of solid particles.

Among the curiosities to be exhibited at the forthcoming International Exhibition at Paris, is a really marvelous little model of an American passenger locomotive which runs under steam upon an endless railway of only 6-inch gauge. It was entirely constructed by an American artisan, formerly connected with the Delaware, Lackawanna and Western Railroad Co.—Mr. W. K. Lendrum—and is valued at £400. The total length of the engine is 5 feet, and is a complete representative of the large engine in every respect, the driving wheels being only 7 inches diameter. The pressure of steam is 22 lbs., and the cylinders, which have a 2½-inch stroke, are but 1⅛-inch diameter; the boiler is but 24 inches long from the smoke stack to the fire pot, and only 5 inches in diameter. Its embellishments are profuse, and include, besides the usual appurtenances, a bell, whistle, sand box and cab.

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THE NEW AMERICAN FILE COMPANY have the exclusive right to use the Bernot process for cutting Files. By this method all the advantages of hand cutting are secured, together with an accuracy unattainable in hand work. They are the only manufacturers who employ machinery for testing Files and Steel.

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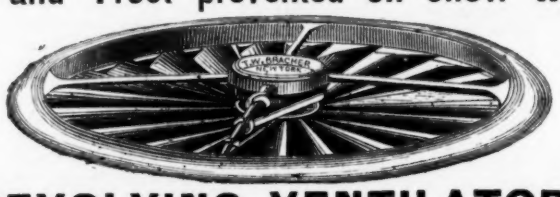

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Kitchens, Laundries, &c., ventilated without draft. Durable, strong, without rivets or solder. Oiled for six months. Each one has storm cap. Retail price, size six inch diameter, $1.00 and upwards; apparatus with which any one can cut circles in glass, 15 cents each.

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Prof. A. L. Loomis, M. D., University of City of New York, writes as follows:

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Rubber supplied with enlarged edge and instructions to enable Car Manufacturers, Carpenters, Builders and far off trade to make slots in Sashes, Doors, Moldings, &c., and thus make perfect Weather Strips.

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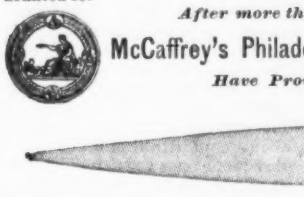

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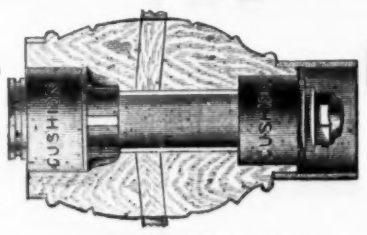

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Best Cast Steel.

HAND-CUT. Manufactured by

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Every File warranted.

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We invite the attention of the trade to our Celebrated American Horse Rasps & Files, made from the very best American Steel, all cut by hand, and warranted to give entire satisfaction. All Rasps & Files not stamped as the annexed incorporated trade mark are not genuine. Sold by Hardware Dealers generally.

Government Standard, Hot Forged

Hammer Pointed

HORSE SHOE NAILS.

Made from the best of **Norway** Iron, and warranted never to **split** or **sliver** in driving.

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O. Ames & Sons, Shovels, Spades and Scoops.

A. Field & Son, Tacks, Brads, Nails, &c.

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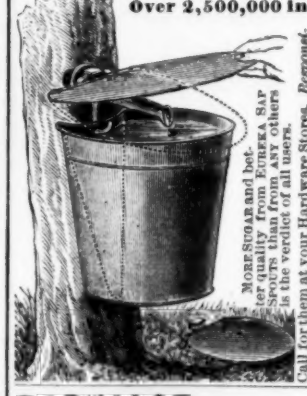
Over 2,500,000 in Use.



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Post's Patent Bucket & Cover Attached.

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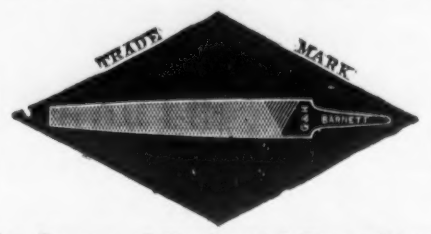

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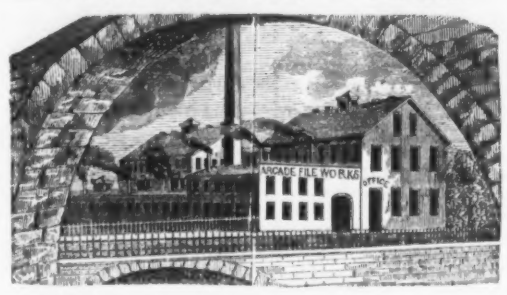

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Quality guaranteed by written warranty when required.

CHARLES B. PAUL,

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Warranted **CAST STEEL.** 187 Tenth Street, Williamsburgh, New York.

All descriptions of Files made to order. Price List mailed on application. **Established 1863.**

Quality Unsurpassed. Every File Warranted.

THRIFT FILE WORKS.

To the Hardware Trade.—

GENTS: We desire to call your attention to our brand of HAND-CUT FILES. The files we offer are of *equal quality*, and made by the same process as those manufactured by Stubs, Butcher, Spencers and others, of Sheffield, England, and we shall so continue to manufacture them until we become satisfied that the American Market demands an inferior File at a lower price, which can only be produced by the introduction of machinery for cutting, which, to this time, we have not thought advisable to introduce in our works, as our files have been *tested by the largest and most experienced consumers, who have decided the great superiority of* HAND-CUT over Machine-Cut Files, and advise us to continue the original process of CUTTING BY HAND as the only method of producing a first-class and strictly reliable article.

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AUSABLE HORSE NAILS

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The Ausable Nails

Are Hammered Hot,

And the Finishing and Pointing are Done Cold,

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Quality is **Fully Guaranteed.**

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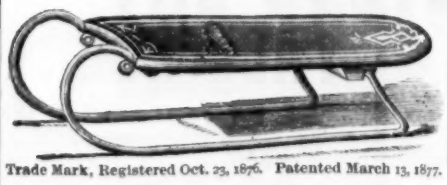

Runners and Cross Bars of one piece of metal, either Cast Steel or Iron, making the strongest as well as prettiest Sled ever made. Its grand success of last year is a guarantee for an immense sale this year. Possessing all the qualities of a perfect sled—unique in design beautiful in finish—makes the Ulster the favorite with children of both small and large growth. A splendid holiday present.

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Patentees and Manufacturers of

The Sheridan Velocipede, Centennial Carriage, Sulky and Seat Springs, Centennial Seat Fasts and Dexter Shifting Bars.

Scientific and Technical.

M. Gautier, in a paper on

THE STRENGTH OF STEEL CASTINGS,

lately read before the British Iron and Steel Institute, gave an account of some remarkable experiments with artillery produced from steel fabricated without blows, or, in other words, metal which had been simply cast, tempered and reheated. A tube 8 inches in diameter was made with a hole 5 inches in diameter so as to leave but 1½ inch of metal on the outside. Nothing was done besides tempering or reheating, after which the tube was grooved, and a screw head adapted to carry the breach. Twenty shots were first fired with 9 pounds of powder and a 40 pound shell, then 10 shots with a shell weighing 47 lbs., and thereafter the charges of powder were successively increased by one-fouth of a pound every 10 shots, the shell remaining identical until the one hundredth shot was finally fired as the conclusion of the trials. On examination no fissure of any kind in the metal was discovered, and the deformation of the chamber was found to be not so much as half the average of that in forged steel tubes. Previous to this test several pieces of the metal were cut perpendicularly from the axis of the tube. The average results, as recorded, of four trials made according to the manner thus described, were as follows: Limit of elasticity, in tons, per square inch, 22.35; charge of rupture, 39.67; lengthening, per cent., 12.47.

The growing popularity of the new style of furniture, first brought to the notice of the American public at the Centennial under the name of

VIENNA BENT WOODWARE,

will doubtless give interest to a brief description of the methods of making it. The industry is conducted chiefly in Moravia and Hungary, but promises to become very general. Articles of this description are remarkable for their neatness, clean finish, light lines, great strength and the fewness of their joints; this latter point being usually accomplished by bending the wood used so as to necessitate as few pieces as possible; thus, an ordinary chair contains, according to this method, only six pieces besides the cane seat, and is said to be an article which has no superior in its way. For this kind of furniture, beech is the only sort of wood used, it being found excellently adapted for the purpose. The trees being felled, the tops are removed and made into charcoal, for use in the glass works; the trunks are sawed into planks of suitable thickness by gang saws, and the planks are in turn ripped up with circular saws into square pieces for turning. If intended for the back and hind legs of a common chair, which are composed of only one piece, the square piece of proper length is put into a kind of gauge-lathe, which does its work very rapidly, and varies the size where needed. The ordinary dowel lathe is used for pieces of uniform size, such as the hoops, which are placed inside of the leg to stay them, instead of straight pieces or rungs, and the hoops are placed so that the feet cannot rest upon them. After being rounded as required, the wood is steamed in the green state for 24 hours, in boilers adapted to the purpose, when it is taken out and bent to the shape desired, on a cast iron frame, by hand. If intended for the seat, the piece is first strapped with iron on its outside, so that the bending shall be a process of compression lengthwise rather than an expansion. It is then attached by one end to a pattern fastened to a turn-table, the other end being held by a chain wound upon a drum, to which is applied a brake, so as to regulate the tension with which the piece is delivered to the pattern; the turn-table is then set in motion, and winds the wood on its own form. If designed for a scroll, the pattern may be complicated and in several pieces, which are put in place at the proper time in the progress of the rotation; for a double scroll, two of the tension bands are employed.

Much interest has been excited in scientific circles by a very perfect piece of mechanism, invented by Commodore Dimple and Mr. Sloane, in the shape of a

NEW CLOCK FOR THE NAVAL OBSERVATORY

at Washington. The weight of the pendulum consists of mercury contained in a glass vessel suspended by a steel rod. When by heat the rod elongates and tends to make the pendulum move slower, the expansion of the mercury in the glass vessel causes a rise in its center of gravity; and as mercury expands some ten times more than steel, a mercurial column of a hight about one-tenth the length of the steel rod will compensate its expansion and cause the center of oscillation to remain always at the same distance below the point of suspension. Every time the pendulum vibrates, its lower point, made of platinum, passes through a globule of mercury, and this contact establishes a connection with a voltaic battery, arranged in such a way that every time the contact is made a ratchet wheel with teeth will move one ratchet and produce a rap. At the tenth ratchet a platinum arm dips into another drop of mercury, making a circuit with another sounder giving a louder tap, so that every ten seconds the louder tap helps in counting the number of seconds. It is stated that by this arrangement an observer is enabled to rate chronometers to half a second, and by continued ratings the computation of errors may be reduced to an infinitesimally small fraction.

At the last meeting of the Metropolitan Railway Company, London, the chairman gave the following statistics of

ONE DAY'S WORK ON THE UNDERGROUND RAILROAD.

I have here a statement showing the number of trains that we run over the system. I find over the main line there are 442 trains in the 24 hours, and over the widened lines 568; that makes the total number of trains in the 24 hours 1010. Well, then, the first engine leaves the shed at a quarter past five in the morning, and the last engine arrives at its shed 1:15. That is on the main line; on the widened lines we are obliged to work during almost the whole of the 24 hours of the day. Our experience is that the great danger is not so much in the want of some mechanical invention—for, thanks to our great engineers and our practical men, we have made the invention, as regards its working, to a large extent a certainty in its action—the danger arises from the fallible human nature which we have to employ, and from the vast multitude of individual, manual and brain operations that have to be conducted hour by hour, in the management of so complex a system as ours. Well, gentlemen, now I will give you the figures of mere signaling. I find that we make in one day, in the 24 hours, 46,826 telegraph bell signals; I find that we make 46,826 telegraph train signals; I find that the movements of the signals and the points of levers, that the actual manipulation of levers backward and forward comes to 66,958; therefore, in one department alone, the mere signaling and working of trains upon the block and interlocking system are 160,000 operations performed every day by human hands, every one of which, of course, might lead to some mistake, which might, more or less, be injurious or damaging.

It is an interesting fact that

THE ANNEALING TEMPERATURE OF METALS

has never been exactly determined. All that is known about it is that there is a fixed and rather narrow range of elevated temperature peculiar to each metal, without the limits of which annealing does not take place, and that the absolute mean temperature for each metal seems to be greater in some proportion as the fusing temperature of the metal itself is higher. Plantina, when hard from wire drawing or lamination, is not annealed under an intense white heat; wrought iron at about a bright red, in some sorts not before a yellow heat; copper, at a low cherry red, and in case of metals of very ready fusibility, such as tin and lead, their annealing temperature appears to be so low that the heat envolved in them by conversion of mechanical force in laminating or wire drawing, is sufficient to keep them annealed, that is, they cannot be hardened by such processes. It is this curious fact that explains the well-known peculiarity in rolling sheet lead or "drawing" lead pipes by the older methods, namely, that the rolling or drawing can be accomplished by a less total expenditure of power if performed fast than much more slowly.

Mr. Brassey on Labor.

Mr. T. Brassey, M. P., lately delivered an interesting lecture in London on "The Comparative Efficiency of British and Foreign Labor," which is condensed as follows in an English exchange:

It is asserted that English workmen have become relatively more idle and less skilled, and that the cost of production has become so great that British goods are being displaced by the exportations of rival manufacturers abroad. These complaints, however, were heard in every great seat of manufacture abroad. There had been a decline in the markets for the chief commodities of export, which was steady, continuous and serious. The price of pig iron had fallen from 80/ a ton in 1874 to 51/6 at the close of December, 1877. In coal, tin and copper there had likewise been a great fall. But we are not alone in our misfortunes. The iron trade was also in a state of depression in France and Belgium, and in Germany it was stated to be one of the most prostrate industries of the empire. It was said that the falling off in the iron trade in England had been caused by the inflation of prices, and that that inflation was chiefly due to the rise in wages. But if we had suffered from this, the same difficulty had presented itself on the Continent. Mr. Brassey then referred to the manufacture of textile fabrics. In England he said the number of spindles at the end of 1874 was 39,000,000, whereas in Germany there were only 5,000,000, in Austria 1,500,000, in Switzerland 2,900,800 and in France 5,000,000. Then the wages in England, he showed, were higher than in Saxony. Taking a factory of 64,000 spindles in England, as against one of a similar size in Saxony, the average earnings of the Saxon operatives are not more than 11/10 per week, while their English fellows, including men, women and children, earned 16/10 each, and this though the English factory hand works many hours less in the week than the German. But the German employer labors under this great disadvantage, that while the English establishment is worked with 3.1 employees to every 1000 spindles, the German requires 5.99 to every 1000 spindles, or nearly twice as many. But while he had endeavored to remove needless apprehensions for our industrial future, he was far from saying that no errors had been committed by masters and men. There were many delusions which the sharp lessons of adversity might tend to dissipate. In this point of view nothing could be more instructive than an examination of the state of the labor market in the United States. The increase of personal extravagance which prevailed in America a few years ago was caused by the Legal Tender act, which doubled the price of everything. Since 1873, however, the American people had been adapting themselves to the altered situation. Income, wages and expenses were being scaled down, profits were reduced, and the American laborer had to make up his mind that he would not be much better off than the European. Wages had fallen some 38 per cent., and yet American manufacturers had competed successfully with other countries in the supply of arms and in other branches of mechanical industry. We had been conquered by the mechanical skill of the employers in devising labor-saving machinery, and by the industry and energy of the workman, who, if they have earned high wages, have worked longer and more industriously than men among our own mechanics have been disposed to. He was not afraid of high wages, but he had a fear lest the foundation of our industrial prosperity should be undermined by restraints on the characteristic energy of our people. If our workmen allowed themselves to be deluded with the notion that by working at half speed they will prevent overproduction, British industry cannot contend successfully against the free and vigorous efforts of our kinsmen in America. The only result of such a suicidal course must be that the people who impose no artificial restrictions on their powers will take our place in every open market.

RUSSELL & ERWIN MANUFACTURING COMPANY

Manufacturers of HARDWARE.

FACTORIES, - - - - NEW BRITAIN, CONNECTICUT, U. S. A.

MANUFACTURERS' AGENTS AND DEALERS IN GENERAL HARDWARE AT OUR

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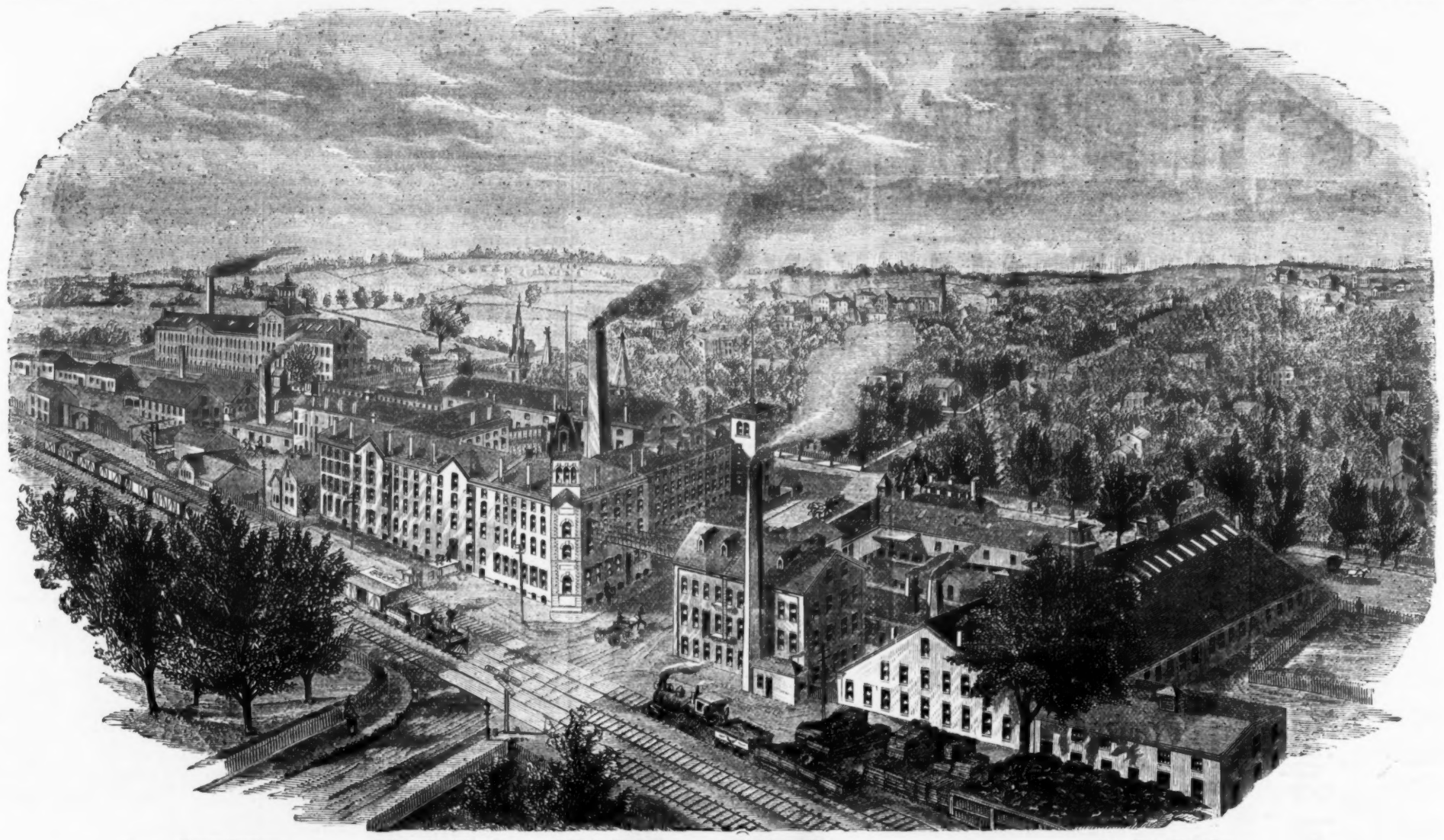

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Complete Assortment at Lowest Market Rates.

Flat Head Iron.
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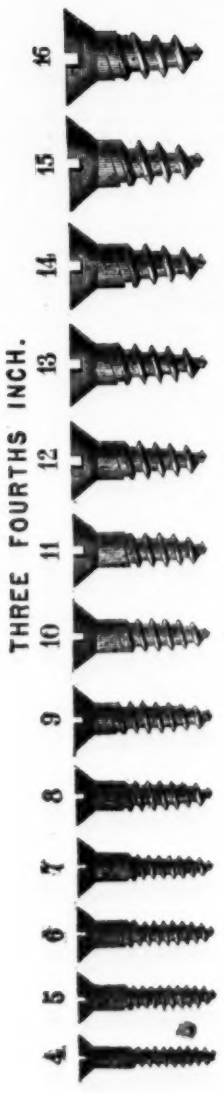
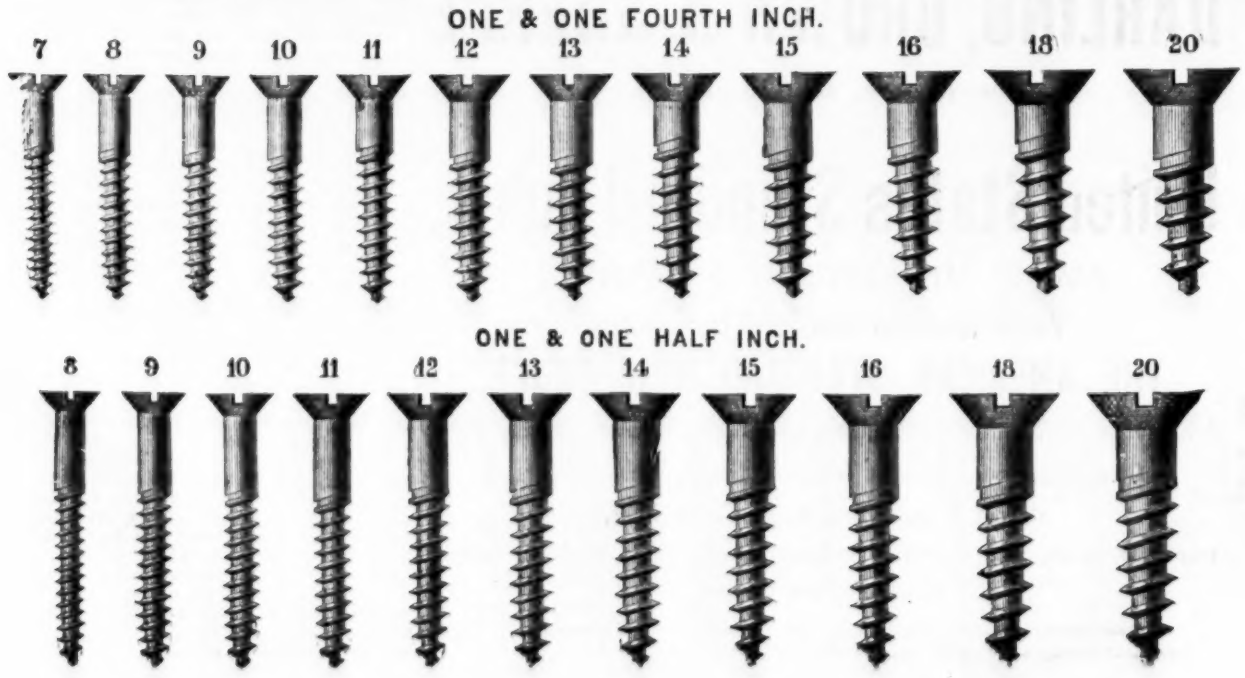
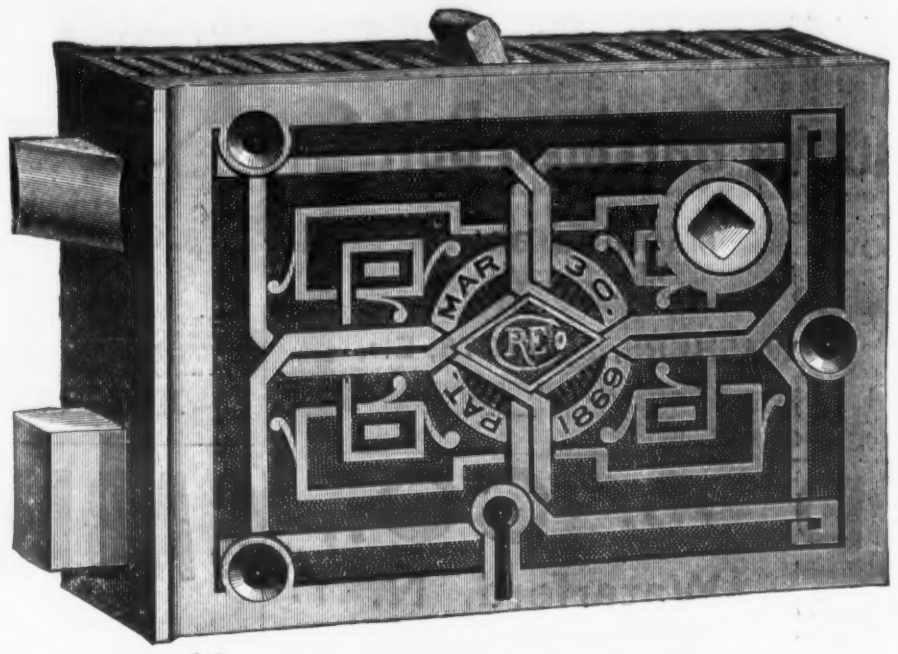


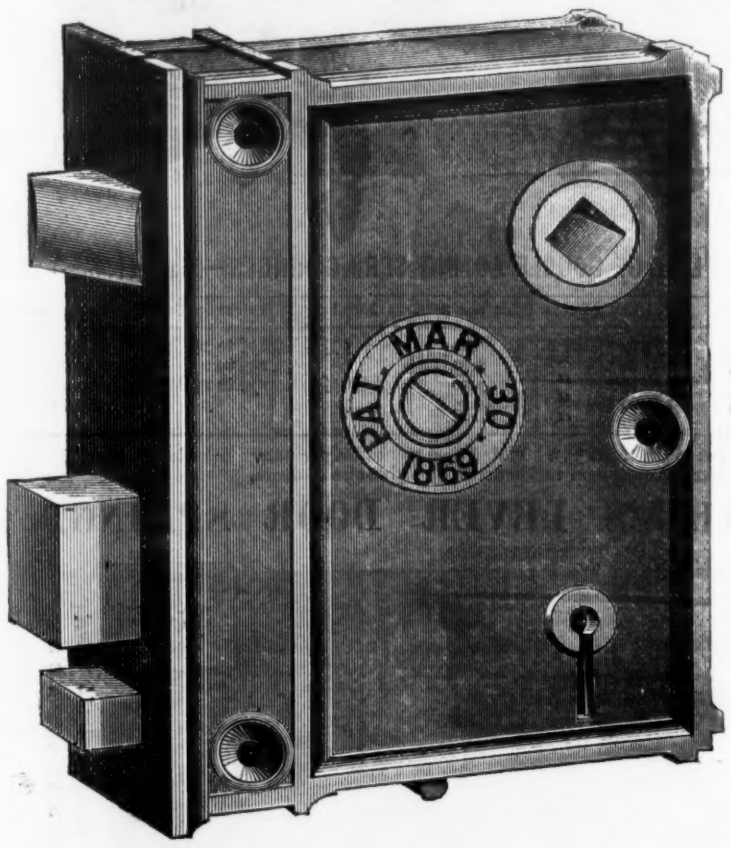


Steel Key Pad Lock, No. 1220.



Kahala Rim Steel Key Door Lock, No. 8241½.

Steel Key Pad Lock, No. 421.



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LOCKS,

viz.,

Door Locks,

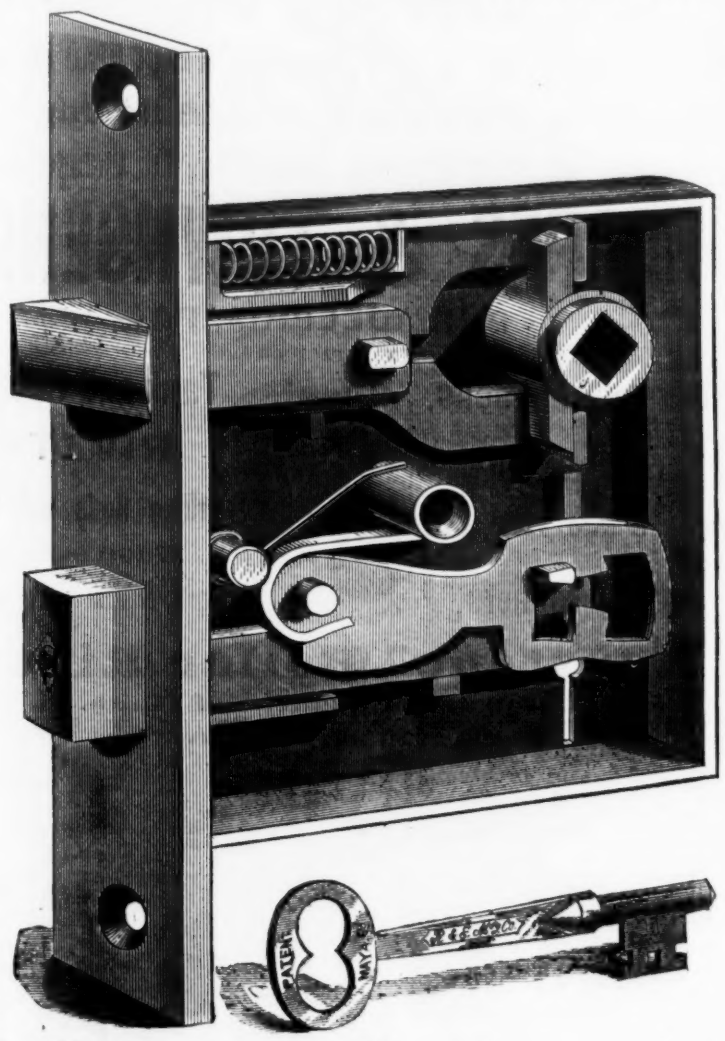
Pad Locks,

Cabinet Locks,

of all grades, and our assortment of these goods is

UNEQUALED.

Also



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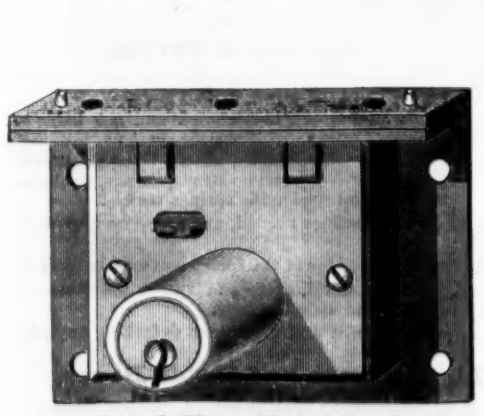
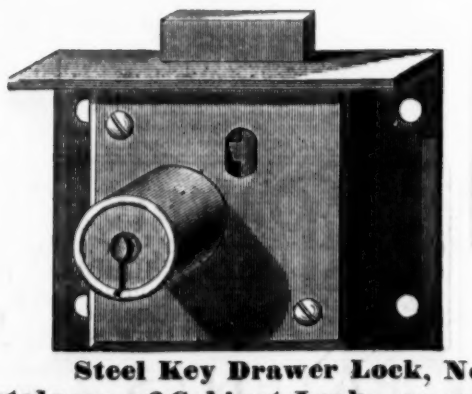


Steel Key Chest Lock, No. 6071.



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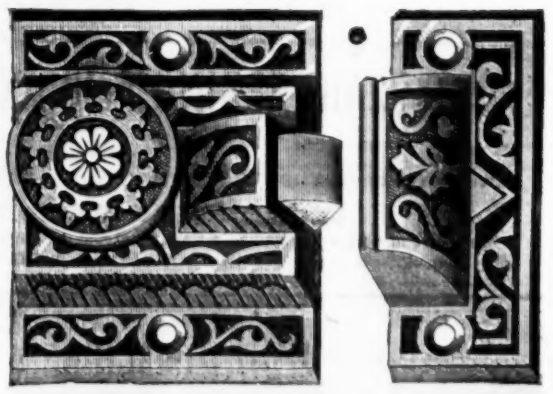

Kahala Cupboard Catch, No. 415.
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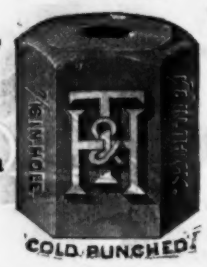

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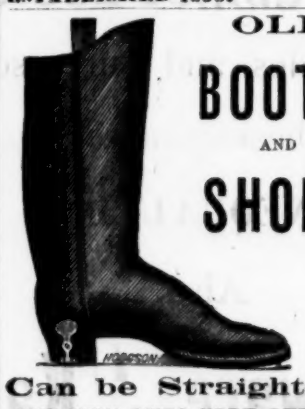

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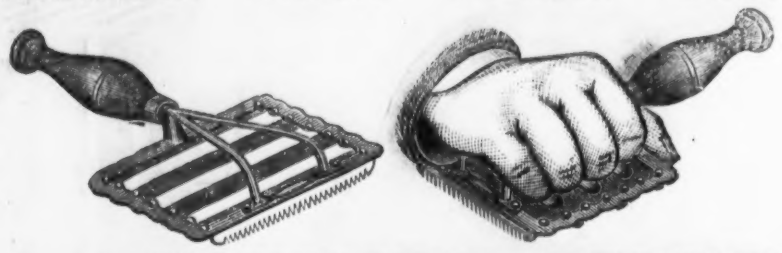
PATENTS.

THOMAS D. STETSON, 23 Murray St., N. Y., Patent Solicitor and Expert.

HOTCHKISS' PATENT "SUPERIOR" COMB.



We invite the special attention of the trade to our Patent "Superior" Curry Comb, which is the *best* and *most complete* side handle Comb having a grasp over the back now in existence, and which for *neatness, strength* and *durability* has no *equal*. Give them a trial and you will be convinced that they are *Superior* to *any* Curry Comb in the market. They are neatly put up in paper boxes of one dozen each and packed 15 dozen in a case. For sale by the jobbing Hardware, Saddlery and Woodenware trade.

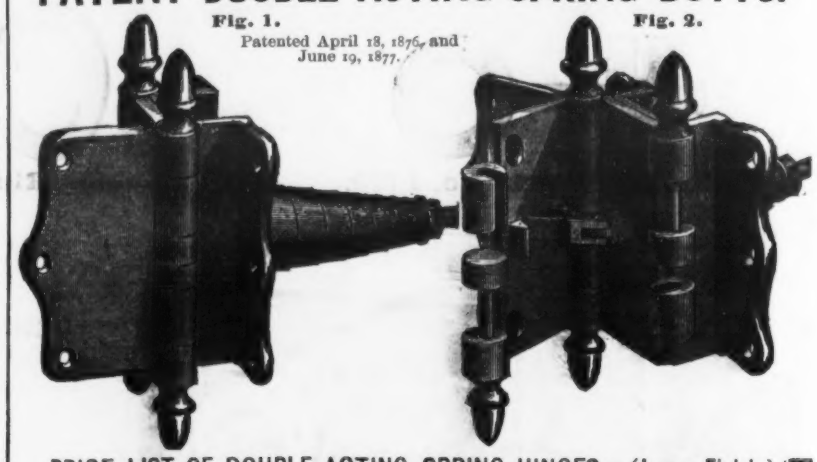
HOTCHKISS' SONS, Bridgeport, Conn.

SABIN MFG. CO.,

Montpelier, Vt.

PATENT DOUBLE ACTING SPRING BUTTS.

Fig. 1. Patented April 18, 1876, and June 19, 1877. Fig. 2.

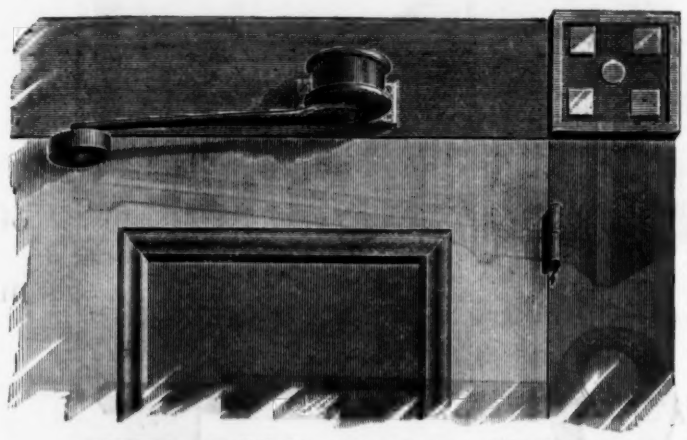


PRICE LIST OF DOUBLE ACTING SPRING HINGES.—(Japan Finish.)

Number.	Thickness Doors.	Price per pair.	Number.	Thickness Doors.	Price per pair
3	⅞ to 1⅛ inch.	$2.50	5½	2⅛ to 2⅜ inch.	$6.25
3½	1⅛ to 1⅜ "	3.00	6	2⅜ to 2⅝ "	7.50
4	1⅜ to 1⅝ "	3.50	6½	2⅝ to 2⅞ "	9.00
4½	1⅝ to 1⅞ "	4.25	7	3 "	10.50
5	1⅞ to 2⅛ "	5.25			

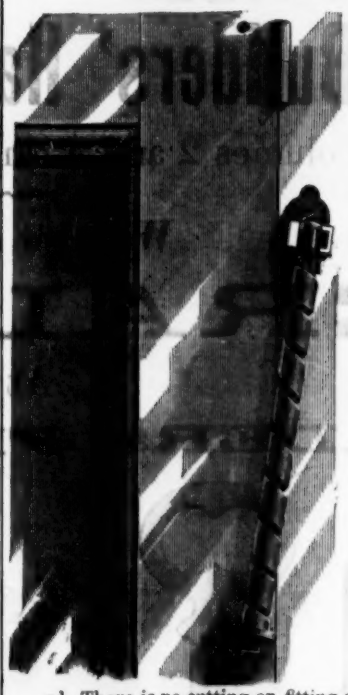
Discount to the trade 35%. Plated tips, 25¢ extra per pair. In ordering these Butts, state whether for outside or inside doors, and give size of doors.

SABIN'S LEVER DOOR SPRING.



PATENTED IN CANADA, March 27, 1876, and Sept. 23, 1876

THE BOSS DOOR SPRING.



The above cuts show our PATENT DOUBLE ACTING SPRING BUTTS for swinging doors both ways. Figure 1 shows the Butt when shut, and figure 2 when opened. These Butts are the first ever constructed with two leaves only, and with flanges attached thereto for fastening to the door and casing, thus rendering them much more substantial and easy to put on, as the screws are all driven from the outside. And the Butts can be put on ready to operate without opening the leaves of the Butt, and by means of the flanges the door is hung firmly to the casing, instead of to a strip, as is the case with all other double acting Butts. A strong right angle flange, cast solid on the leaf of the Butt, embraces and clamps the door-stile firmly, and the screws do not become loose, as the strain on them is much less. The attachment of flanges to the leaves of a double acting Butt is a new and important improvement in double acting hinges, for which device a patent has been issued. At the back of the other leaf is attached a powerful volute spring, the draw-rod of which is linked to the first named leaf and throws the strain of the spring in a direct line with the center of the door. This spring holds the door up firmly to its place and obviates all tendency to sag.

Our Lever Spring.

The advantages of this spring for heavy outside doors subject to strong air currents:

1st. It is simply constructed and not liable to get out of order.

2d. It is self-contained—there being no attachment to the door—and no straps, strings, or chains to break and render the springs useless.

3d. There is no cutting or fitting of doors or casings needed, and any person of ordinary skill can put them on.

4th. The simple and ready adjustment of the tension of the spring—as may be desired.

5th. It closes a door perfectly if only opened a few inches—and is more desirable—as the wider the door is opened, the less pressure is had upon the door.

6th. It can be rendered inoperative at any time if desired without detaching any part of it.

Our Boss Spring for Light Screen and Inside Doors.

The advantages of this Spring over all other cheap Springs are its superior elasticity, being coiled from flat steel, and not as rigid in its action, or as liable to set in operation. Our patented method of adjustment is superior, as there are no pieces to lose, and no possibility of the Spring becoming detached in operation. The Spring can be readily removed when desired without taking out any screws, and quickly replaced when wanted.

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BEST QUALITY CARRIAGE MAKERS' HARDWARE.

Manufacture the Largest Variety of Forged Carriage Irons of Best Material and Workmanship.

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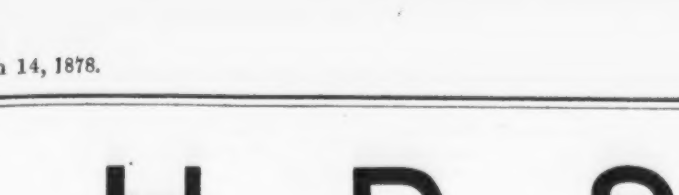

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NATHAN WEED, - - - - - **4 Gold Street, New York.**

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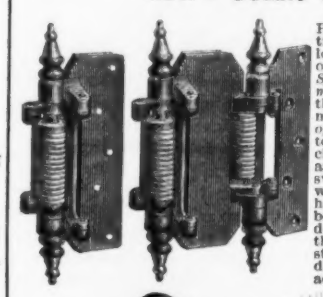
Side Spring Connecting Rods.

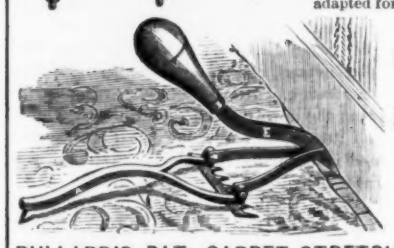
The Cowles Hardware Co., Unionville, Conn.,

MANUFACTURERS OF

Geer's Double and Single Action Spring Butts.



Reverse in action and radically different from any other in market. Patented July 17, 1877. The accompanying cut shows our Double Action Spring Butts for swinging doors both ways. We claim the following points of superiority: *First.*—These Butts differ from all others in principle and action, combining the *Toggle Arm with the Spiral Spring*, which by actual test gives out from 60 to 80 per cent. *more force* at the *closing point* than when opened to a right angle, thus holding the door firmly in place, and not allowing it to be moved by currents of air. *Second.*—*They will allow the door to be opened clear back to the wall*, and the spring retains it there; thus the toggle and spring fill two important offices—that of holding the door closed and also open. *Third.*—It is impossible to strain the spring, as there is not more than 60 per cent. of the elasticity of it used in swinging the door back to the wall, therefore it will not become weak from constant use. *Fourth.*—The bearings are all faced with hardened steel, which is much superior to common cast iron or brass, both in regard to friction and durability. *Fifth.*—They will hold the door firmly up to its place on the top, and not allow it to open off, thus obviating all tendency to sag. *Sixth.*—These Butts are so constructed that there is no right or left hand. When adjusted to the door they *never need taking up or letting out*, as they are perfectly adapted for either summer or winter, without any change whatever.

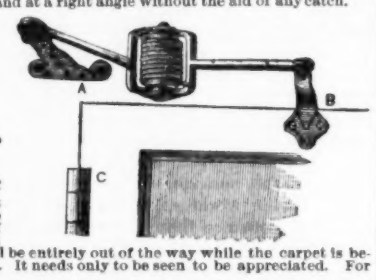


HERCULES

Reverse Action Door Spring and Retainer.

(Patented March 4, 1873.)

On an entirely new principle, distinct from all others. Holds the door open as well as shut, and allows the door to stand at a right angle without the aid of any catch.



BULLARD'S PAT. CARPET STRETCHER.

Patented June 13th, 1876.

The best thing ever made for laying carpets. It is light, simple in construction, durable and not expensive, is very easy to operate, and is warranted not to injure the finest carpet. It holds the carpet in position after it is drawn to its proper place, thus giving the operator the free use of both hands with which to do the nailing. The lever, E, is then folded back and down upon the push bar, A, so it will be entirely out of the way while the carpet is being nailed. No person using one once will be without one. It needs only to be seen to be appreciated. For utility it defies competition.

Also manufacturers of Awls, Bung Starts, Butter Spuds, Bill Hooks, Brush Hooks, Butts (Double Spring and Single Spring), Border Knives, Box Openers, Box Hooks, Box Scrapers, Cleavers (Cast Steel), Cake Turners, Corn Hooks, Cover Lifters, Cold Chisels, Carriage Jacks, Carpet Stretchers (Bullard's and Common), Door Springs (Hercules and Air Cushion), Fish Turners, Ferrules (Brass), Handles, Hammers (Magnetic Tack, Steak, Steel Tack and Iron Tack), Hoes (Shuffle), Ice Axes (Iron), Ice Awls (Lignumvitæ, Iron Heads and Maple H'dle), Ice Tongs, Mouse Traps (Pat. Automatic), Mincers (Cast Steel and Hammered), Nail Sets, Nut Cracks, Punches (Round), Screw Drivers (Sewing Machine, Lock Sp'les, Bit Brace and Implement), Trowels (Garden), Tack Claws, Vegetable Slicers. Send for price lists and discounts.

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Fluting & Smoothing Iron.

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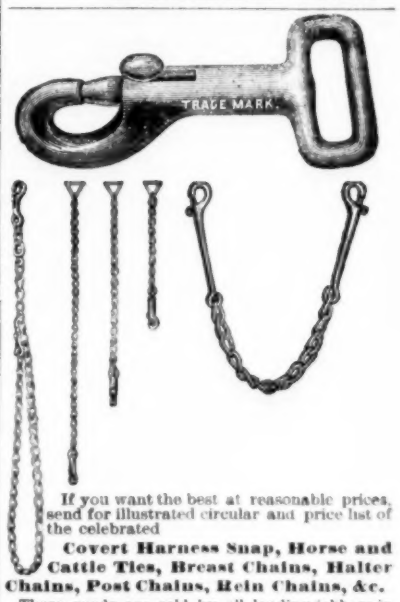

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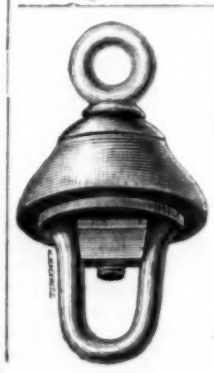
Address **COVERT MFG. CO.,**
Sole Manufacturers, **Troy, N. Y.**



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RUBBER BUCKET

For Chain Pumps.

The Best in Use.

Patented March 16, 1875.

Sizes of Bucket, 1¼, 1½, 1¾, 2 inch.

A. L. COREY,

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The Iron Age.

New York, Thursday, March 14, 1878.

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CONTENTS.

An engineering work which has attracted much attention of late, partly on account of the fate of the Metropolis while en route, is the contemplated Madeira and Marmore Railway, to connect the tributaries of the Amazon with the interior of Bolivia. A cable dispatch from London intimated that the funds of the company were about to be distributed among the bondholders; that Col. Church's drafts in behalf of the engineers had been dishonored, &c. The immediate inference was that the whole scheme had "gone up," and that possibly Col. Church's engineers might be glad to get home again. We learn at the office of the Bolivia Steam Navigation Company, as explained by the contractor, Mr. Collins, that the trouble arises from a technical error which will be remedied. We hope so.

Late Events in the East.

Of all the wars which Russia has been waging with Turkey, the one just brought to a termination has been the most decisive. The protection of Christians in Turkey, which served as a pretext or motive for the war, has now been secured, and Turkish misrule will not seriously affect them in the future. While Russia has thus attained, at the expense and risk of a short but most sanguinary war, that which former strifes, including the Crimean campaign, and the many conferences and joint interventions failed to accomplish, justice demanded that the victor should reap the full benefit of indemnifying financial, territorial and political advantages accruing from the prostrate condition of the vanquished.

The treaty of peace, so far as known, while wresting from Turkey the greater portion of her dominions in Europe for the formation of the new suzerainty of Bulgaria, enables Russia to exchange the acquired Dobrutscha for the Bessarabian portion of Roumania, secures to her at the same time the various fortified places which she captured in Armenia, and indemnifies her besides in the amount of $225,000,000.

The settlement of the question of the Dardanelles is left to international arrangement at a conference yet to be held. Everything has thus been avoided directly antagonistic to British interests. The firmer and more resolute attitude of England has not failed to be effective. The interests of Austria, on the contrary, have been almost wholly ignored, although she is the greatest Danubian country. Upon her very borders an important Slavonic state is to be reared under the nominal suzerainty of the Porte, but in reality a vassal of the overshadowing Northern power. If Austria were a homogeneous nation, she would not have tolerated the formation of this strategical wedge directed against the most vital and sensitive flank of her dominions; but with her 17,000,000 Slavs and 9,000,000 Germans she harbors such conflicting interests, that the sense of self-preservation commands her to abstain from drawing the sword, preferring the lesser evil to the greater possible one of political disruption and military defeat. With Germany and Italy, both doubtful neighbors, secretly coveting a portion of her territory, and Russia wanting pretty much all the rest, Austria finds it the part of wisdom to acquiesce in the results of the Russian victories, and eschew all hazardous action, trusting to diplomacy to make her voice felt when the conference is convoked.

The object which the conference will mainly have in view will be to determine the future public law of nations relating to the passage of the Dardanelles in times of peace and war. We hope, in common with the strongly expressed wishes of French statesmen and journalists, that the conference will also place under international guaranty the passage of the Suez Canal, which, to the world at large, is of much greater importance than the comparatively land-locked Dardanelles. The Suez Canal should be neutralized, and thus protected against any high-handed occupation by one or more maritime nations in the event of future conflict growing out of the Eastern question. In spite of the peace and approaching settlement of the chief points in dispute, the Eastern question may be looming up again after a while in a shape more menacing to existing territorial arrangements than it has yet assumed, and naval action may then converge on Egypt and the canal to the detriment of neutral nations, whose peaceful use of the canal may then be indefinitely interrupted, and the world's commerce subjected to the most injurious interference.

As for the general commercial results to flow from the peace just concluded, they can only be beneficial. The uncertainties which hampered the revival of trade in Europe while the war clouds were still hovering over the old world, will now soon be dispelled—at least for the time. The trade of Russia, Turkey, Austria, Italy and France will be freed from the paralyzing effect of partial interruption by a gigantic war in the rich valley of the Lower Danube; Russia can sell the grain of her Southern provinces and buy goods with the proceeds; railroads and bridges will be rebuilt, new lines projected, and the busy hum of toiling thousands will soon be heard in the magnificent country south of the Balkans, whose unfortunate inhabitants have suffered more in two years than any nation of Europe since the Turks captured Constantinople more than four centuries ago.

M. Leon Chotteau, delegated member of the French committee whose appeal to the people of the United States we print on another page, sailed for this country in the steamer France, which, if not already in port as we go to press, will probably arrive before this issue reaches our readers. His errand in this country is to organize a committee of American manufacturers to cooperate with the committee he represents in furthering a movement looking to a commercial treaty between France and the United States, establishing reciprocal trade relations mutually favorable. M. Chotteau will probably find a divided public sentiment respecting the movement he seeks to organize, and encounter many difficulties which one unacquainted with our people and our commercial system would not expect to meet. It must be said, however, that while France is a desirable field for the sale of certain large and important classes of our manufactures, she is less a competitor than many others, and we could establish reciprocity with her with less danger to our own industries than would attend such relations with most other countries.

Local Engineering Works.

As the several important engineering works in progress or proposed in and about New York are always subjects of interest to the public, and especially to manufacturers of iron who are looking forward to contracts for materials, we have collected some information respecting them during the past week which we believe is trustworthy.

Work on the foundations of the great truss bridge across the Hudson at Poughkeepsie will be resumed for the season in a few days. The nature of the work and the objects of the structure, estimated to cost $3,500,000 to $4,000,000, are but imperfectly understood. This bridge is designed to open communication between the coal regions of Pennsylvania and central New England, also with New York city *via* the Hudson River Railroad. According to the provisions of the charter, it will be free to all roads, so that there can be no combinations to control its ownership. The west foundation caisson (the first in a series to support five spans, each 525 feet) has been sunk to its position, and upon it 22 feet of masonry have been built, bringing the same above high-water mark. The cassion is of heavy squared timber, transversely framed, the outside dimensions of the whole being 50x100 feet, making a series of "pockets" extending around the outer sides and ends and through the center. The bottom is solid to the depth of 16 feet, wedge shaped, to penetrate the gravel beneath. The object of the pockets is to receive the concrete required to overcome by its weight the buoyancy of the timber. When the caisson can be sunk no further, dredging is resorted to, this process being carried on by the "clam-shell" apparatus through twelve open pockets, each 11 feet square, as just described. After the dredging is finished, the foundation being at rest, divers are sent down to remove all sediment, thoroughly cleansing every part to the river's bed. Concrete is then filled in, and twenty-eight side pockets with tight bottoms are similarly treated, thus making forty perpendicular piers of concrete, held together and confined by the timber, which is brought to within 25 feet of the surface, constituting the foundations of the bridge. The difficulties overcome in sinking the open caisson to the depth which it had to go, and the perfect success obtained in securing reliable foundations, are regarded by the chief engineer, Mr. J. J. Dickinson, of this city, as demonstrating the entire practicability of prosecuting similar work in any depth of water where the bottom can be reached by dredging, which in this case was 97 feet below high water. The foundations for the second caisson are already sunk to the depth of 97 feet, and they must go 15 feet further, making the depth of foundation 112 feet below high water. Sixty days will be required to complete this latter foundation and erect thereon masonry to a point above high water. A third caisson is on the ways, ready for launching. The Poughkeepsie Bridge Company has obtained an extension of the charter for three years in which to complete the work. The hight of the truss is 58 feet; the hight of the bridge above tide water is 130 feet.

Respecting the Hudson River Tunnel, Col. D. C. Haskin, who is looked upon as the prime mover in this enterprise, remarked a day or two ago to our reporter that they expected to be able to speak definitely in a few days of the prospects of the work. He denied that the undertaking was in any sense abandoned. The intention is to go forward as soon as practicable. A movement in the State Legislature designed to impair their chartered rights, could not, in his opinion, have any effect. He would pay nothing to influence legislation one way or the other.

The "Central Underground Railway," with which the name of Mr. Vanderburgh has been prominently associated, is another work concerning which the public would like to know something. At last accounts certain English capitalists were about to take control and move forward. Mr. Vanderburgh expresses no doubt as to the ultimate success of the undertaking, simply remarking that it remains with "the London syndicate" to determine what shall be done.

The East River Bridge steadily advances. Forty-four of the 76 strands for the main cables have been completed and two others have been commenced. The original plan of the structure has been modified somewhat, to avoid exposing so much surface to the wind. Progress is most noticeable in the tearing down of an entire block of buildings in Frankfort street, near Cliff, to make room for the approaches.

The New York Elevated Railroad Company have appointed Col. R. E. Ricker general manager of the work, but as yet he is not prepared to speak of his intentions. Col. Ricker for the last six or eight years has been superintendent of the New Jersey Central Railroad and identified in an official capacity with various other leading railway corporations. We learn from Mr. Katta, the chief engineer, that bids for 30 locomotives already received will be decided the present week. For the cars, 75 or 80 in all, specifications are not yet complete. The ironwork is going up rapidly. Surveys are in progress in the upper part of Third avenue, and contracts will soon be out for the sections between Sixty-first street and Harlem River on the East side and from Sixty-first to Eighty-first streets on the West side. The Messrs. Cornell are driving the ironwork for the new depots with all speed.

Mr. Foster, president of the Gilbert road, says they will know about their rolling stock two weeks hence.

Cost of Moving Freight, and Revenue from the Same.

The report of the Pennsylvania Railroad which has just been given to stockholders, furnishes the basis for some very interesting deductions not only to the stockholders, but to all who are interested in the subject of transportation, as every one engaged in business must be sooner or later. In this country the chief source of difficulty, outside of the labor question, is in the cost of the long stretches of land carriage both raw materials and manufactured articles must be burdened with to get to market and the place of consumption, and any fact bearing on the cost of this transportation is valuable, as furnishing some ground upon which to base arguments and from which to seek for some method of cheapening the cost.

The Pennsylvania road is one of the best managed in the country. Its track and equipment are in the very best condition for the rapid and economical movement of freight and passengers. It has heavier grades than some of its competitors on certain portions of its road, but reckoning from the great distributing centers of the West it is nearer to the seaboard, and for many miles it runs through coal fields that give it its fuel at a much less rate than those roads which are better conditioned as to grades, an advantage that more than compensates for the disadvantage.

Taking up first the subject of freights, we find that the total number of tons of freight moved in 1877 over the Pennsylvania road and its branches and all lines east of Pittsburgh was as follows:

TONNAGE MOVEMENT OVER LINES EAST OF PITTSBURGH.

	1877.	1876.	Inc.	Dec.
Main Line and Branches	9,738,295	9,922,911	.....	184.616
United R. R. of New Jersey	3,962,523	3,912,972	49.551	.....
Phila. and Erie.	2,681,450	2,517,470	163,980	.....
Del. and Rart'n Canal	2,023.443	1,897,708	125,735	.....
Total	18,405,711	18,251,061	339,266	184,616
Net increase			154,650	

Note.—The Belvidere Delaware Railroad having been operated during 1877 under lease to and as part of the United Railroads of New Jersey, its tonnage is included in that division, while in the statements submitted in the report for 1876, it appeared separately.

TONNAGE MILEAGE ON LINES EAST OF PITTSBURGH.

	1877.	1876.	Inc.	Dec.
Main Line & Branches	1,494,798,198	1,629,742,011	.....	134,943,823
United R. R. of N. J	256,134,009	251,608,474	4,527,625	.....
Phila. & Erie	335,727,141	340,390,703	.....	4,663,562
Del. Raritan Canal	93,800,450	87,814,458	5,985,992	.....
Total	2,180,459,888	2,309,553,656	10,513,617	139,607,385
Net decrease				129,093,768

The average mileage of each ton of freight hauled in 1877 was 113 miles. In this connection it is interesting to observe that of the 9,738,295 tons moved over the main line, only 1,307,787 tons were through freight, while 8,430,508, or six times as much, was local freight, showing that much the larger part of its revenue is derived from that to which the least attention is paid, and from which, according to popular impression, the least revenue is derived.

The most important table in the report is the one showing the cost and revenue per ton per mile on the several divisions operated by the Pennsylvania Railroad:

Freight.	Penn. R. & Branches.	United R. R. of New Jersey & Branches.	Phila. and Erie R. R.	All lines east of Pitts. & Erie.
Length of road (miles)	1,055	373	288	1,716
Ave. earnings per ton per mile from transportation of freight	0.980	1.510	0.786	1.013
Ave. cost of transporting each ton of freight 1 mile	0.552	1.159	0.483	0.615
Ave. profit per ton per mile	0.428	0.351	0.393	0.398

It is nowhere expressly stated in the report what items are included in the cost of transportation, but, judging from another table given, it includes conducting transportation, motive power, maintenance of cars, and way and general expenses. If this is so, it leaves all the balance termed profit, and amounting in the case of the main line and its branches to 43 per cent. of the entire freight receipts, to be applied to interest in bonds, payment of interest which the road has guaranteed, and dividends.

This is not the place, nor is it our intention now to enter into a discussion of the ability of this or any other railroad to carry freight at lower rates than is customary when rates are not being slaughtered, but it certainly seems that 43 per cent. profit on a line that has cost no more than the Pennsylvania Railroad, is too great. There may be, and probably are, reasons why it is necessary to make such a profit, and it is difficult to see how other conditions can be made to exist without injustice. The future of railroads in this country does not offer a very brilliant outlook to stockholders.

The letter of Mr. George M. Thomson, of this city, to Hon. Roscoe Conkling, chairman of the Senate Committee on Commerce, which we print on another page, merits careful and intelligent perusal. It discusses the question of our national registration laws, and presents some good reasons why they should not be repealed to make an American market for vessels which can no longer be employed safely or profitably in trading under the British flag. Mr. Thomson understands his subject perfectly, and his letter is exceedingly interesting.

The Prospects of Tariff Legislation.

The opinion is fast gaining ground that no definite action can be taken on the tariff bill during the present session of Congress. Business in Congress is hopelessly behindhand, with no prospect of making up lost time. In view of this fact, Senator Eaton, of Connecticut, is preparing a bill providing for the appointment of a commission of seven, to sit in New York for six months or a year, and take the testimony and receive the opinions concerning the tariff of men interested in all branches of productive industry. The six most prominent industries of the country are to be represented on the commission by six men who are practically informed on the subjects which they represent. As, for instance, one man is informed by practical experience on the iron trade, another in the manufacture of woolen goods, a third in cotton manufacture, a fourth in the sugar trade, &c. The seventh member and chairman of the commission is to be a man of experience in finance, political economy, &c.

If it is the fixed policy of the party in power in Congress to continue the agitation of a change in the tariff, this scheme may be as good a one as can be desired to get at the views of manufacturers. It is certainly better than employing mere clerks and foreigners to prepare the tariff legislation of the country, and then slamming the doors in the face of those who are thoroughly acquainted with the wants and needs of our industries. We question, however, the propriety of having the sessions of the committee in New York. For some branches of industry it is the best place for meeting, but for others it is not. The work of this committee should be thorough, and the great centers of industry should be visited and the views of individuals, both employers and employees, taken. For instance, in investigating iron, the committee should sit in Philadelphia and Pittsburgh; where cotton is concerned, Boston and Atlanta should be selected, and other industries have their centers that would claim meetings. The best thing would be to stop agitating tariff changes, but as this cannot be hoped for, let us have a good committee of experts with time to inquire into the subject.

Washed Coke for Southern Iron Makers.

We are glad to see that the Southern coke makers appreciate the importance of washing their coal. As we have already noted, one company extensively engaged in mining and about ready to engage in coke making, will have their washing apparatus in use in a few weeks. And now we learn that the proprietors of Sewanee mines, who are probably the most extensive coal miners in the South and the largest coke makers, are preparing to wash their entire product. They now make 360 tons of coke per day, their full capacity being, however, 400 tons. This coke by analysis is shown to be almost identical in its constituents with the Connellsville coke, and when it shall have the additional merit of thorough washing, the Southern furnaces supplied by it will have a superior fuel to that in general use and equal to any in the United States.

The managers of Dade mines are also preparing to wash their coal. They are now making about 80 tons per day of excellent coke, and are furnishing one-half the fuel used in the Rising Fawn Furnace. At present the companies owning the Sewanee, Dade and Etna mines are the only dealers in coke in the Southern district. The Southern States Coal, Iron and Land Company when in operation, which will be in a few weeks, will manufacture coke extensively, and all of them announce their intention to furnish washed coke to their customers without any additional cost to the furnacemen. This indicates that the quality of coke iron made in the South will be decidedly improved within the current year.

There promises to be a greater exodus from the East to the West this season than for many years, if indeed it has ever been exceeded. From all prominent manufacturing centers the surplus mechanics who have or can borrow the means are forming in colonies and preparing to emigrate. In some cities associations have been in existence for months, the members paying a certain sum weekly into a general fund to purchase land and pay transportation. Kansas seems to be the objective point of many of these colonists, the arrivals at Atchison reaching 900 to 2000 per day. This great Westward movement of population is another instance of history repeating itself. A similar movement followed the great panics of 1837 and 1857, and in redistributing the population, and in changing the producing and consuming relations, was the harbinger of returning prosperity in those days. When these thousands cease to become producers of manufactured articles and become consumers, and at the same time produce not only what agricultural products they consume but a surplus for sale, the disordered relations will readjust themselves and a returning prosperity can safely be predicted. It has been the unwillingness of surplus labor to give up the hope that it would yet get employment at its accustomed

tasks, and its disinclination to undertake farm labor, that has delayed the return of better times. In this movement we see that at least this illusion has been dispelled and the only course taken that can bring better times.

The Duty on Scrap.

The following petition is in circulation:

To the Honorable Senate and House of Representatives in Congress assembled: The undersigned, iron manufacturers and consumers of iron, respectfully represent that the proposed reduction in the duty on scrap iron, both cast and wrought, to one dollar per ton, is a measure by which no interests will be disturbed, and one which will prove of great value, not only to consumers of iron on the Atlantic coast, but to the whole country. We believe the policy of letting in raw material at a low rate of duty to be in every respect desirable. And as in duty bound your petitioners will ever pray.

The iron manufacturer who signs this petition stultifies himself. Scrap iron is not a raw material. It is a manufactured product—wrought scrap particularly—and its importation under the nominal duty of $1 per ton would practically destroy the blast furnace industry of the United States. To say that "no interests will be disturbed" by the proposed reduction, is to make a statement so mendacious that we scarcely know how to characterize it except by the use of terms more forcible than elegant. It would cripple ore mining, destroy a good part of our pig-iron industry, demoralize the rolling mill interest, cheapen iron by still further lowering the standard of average quality, and throw thousands out of employment. It would prolong the present unfortunate condition of affairs, which is favorable neither to the manufacturer nor the consumer of iron, and would open the door for unnumbered frauds on the revenue. In a word, it has nothing to recommend it, and if the above petition receives the signatures of "iron manufacturers and consumers of iron," we shall believe it possible to secure signatures to a petition praying Congress to adopt measures designed to ruin American manufactures, impoverish American workingmen and pauperize as many as possible of our people.

In his recent report to the stockholders of the Pennsylvania Railroad, Col. Scott proposes the establishment of a sinking fund for the purchase of the bonds and shares of other railroads which are guaranteed by the Pennsylvania Railroad. The proposition is as follows:

That there shall be appropriated from the net earnings of the company the sum of $100,000 per month, commencing May 1, 1878, which sum shall be deposited in a satisfactory trust company in the city of Philadelphia, if arrangements can so be made which will be approved by the board, with which will be associated two competent and responsible shareholders as trustees under a special trust.

As the dead weight upon this road is the securities of other roads it has guaranteed, it certainly is sensible to get these securities out of the way. The plan proposed, which is very similar to that created by many of the English railways as a representation of capital, and known as a terminable debenture, offers a reasonable way of unloading the obligation, or putting it in another form so that it will not bear so heavily upon the earnings of the road. The trouble will be to make the stockholders see it in this way. The stock of the Pennsylvania Railroad is held for investment to a larger extent than any other road in the country, and persons and institutions that expect or need the dividends are not hasty to yield the amount named; but the temporary loss will be more than made up in the near future, and there must be a scaling of capital to the present basis of things, in railroads as well as in private enterprises, either willingly or by unpleasant means.

In the article on the first page of our issue of March 7, entitled "A Sheffield Man's "Opinion of American Matters," the true state of affairs in regard to the employment of foreign labor is stated. The writer says: "The American has many drawbacks; the "raw material has heavy transportation to "bear, and is often badly manufactured, and "their best hands are almost always Old "Country people. They are hired at high "wages to come over; natives are put under "them to learn the business, and before they "know it their services are not required any "longer; the Yankee has learned their trade "and improved upon it." If the writer had said: "Their best hands were *formerly* "Old Country people," he would not only have told the fact, but have made this sentence correspond with the last one in the paragraph quoted. It is this last paragraph that gives the pith of the present condition of our iron works, and especially our steel works. The best workmen are not now Englishmen but Americans. The English manufacturers are hugging the delusion that the advances we have made in the manufacture of steel, for example, have been due to the fact that English steel workers have lately been brought over and given charge of our steel works. But this is not so. At Pittsburgh the cases where foreigners are in charge of the various departments of the steel works is the exception, and no Sheffield or any other foreign steel workers have been brought to this country for years.

On another page we print from an English journal, the *Mercantile Shipping Register and Commercial Gazette*, an article entitled "American vs. English Manufactures." Considering the character of the journal and its large circulation and influence, the article in question is one of the most remarkable we have ever read. It concedes the superior excellence of many lines of American manufactures, notes the rapid growth of our export trade, explains it on the ground that our goods are better than those they come into competition with, and, in a word, admits a great deal more than any American journal ever claimed. Such candor is commendable, but it is certainly unexpected.

New Publications.

A Manual of the Mechanics of Engineering. By Julius Weisbach, Ph.D. Translated from the German by A. Jay Du Bois, Ph. D. John Wiley & Son, New York. Price $6.

Weisbach's famous manual on mechanics is too well known to English and American engineers and students to require praise. Prof. Du Bois has continued the work which Prof. Eckley B. Coxe so ably began but did not carry beyond the first volume. The volume before us is the first installment of the second part of the great work. The translator has supplanted the first section of the work, on the application of mechanics to bridge and roof trusses, arches, &c., by an introduction in which he has embodied a short review of the more important ideas and principles, the application of which forms the body of the work itself. Its contents are the measurement of motive powers and their effects, the collection of water for power, and a profound and detailed discussion of water motors, water wheels, turbines, water pressure engines and wind wheels. The translator has been careful to imitate the example of the author in giving, whenever a technical term is used, the equivalent in French and German, which will be of great aid to those who wish to avail themselves of the numerous references to German and French literature cited. He has succeeded in carefully rendering the author's language without falling into the error, too frequently repeated by those who publish English editions of foreign technical works, of following the wording of the original too closely. The book is fully illustrated and well printed, the formula, often complicated, being admirably set. Whether they are correctly rendered can, of course, only be ascertained by use. We cheerfully recommend Prof. Du Bois' translation to all of our readers who desire to make mechanics and its application to engineering a study.

The Pattern Makers' Assistant. By Joshua Rose, M. E. Published by D. Van Nostrand.

To all those who wish to acquire the elements of pattern making, and who are willing to accept as a guide in their practical work printed advice as well as the oracular statements of older shopmates, this work will be invaluable. It gives careful consideration to the tools used in pattern making, examines them, explains their working and their value. The author concisely treats the important subjects of moulding, cores, contraction of castings, lathe work, pegging, &c. The text on pipe and joint work, wheel and pulley work, pipe bends and lagging valves, gear wheels and cogging is illustrated by numerous examples. An additional chapter gives a description of the machine tools used for pattern making. The whole is supplemented by a series of tables giving weights and measures, squares, cubes and roots; scantling and timber measure, and the proportionate radii of wheels, thus making the work not only what it is claimed to be, the pattern makers' assistant, but, in all probability, his constant companion.

Woodward's Ornamental and Fancy Alphabets are a collection of designs of alphabets which we strongly recommend as patterns to all who in drafting, painting or lettering of any kind would deviate from the tiresome, long-trodden paths still in vogue, and who would add a great charm to their work by carefully executing either the models presented to them in this work, or basing upon them develop a new and pleasing individual style. For such purposes they will find ample material in 80 plates of clearly printed designs which compose the work before us.

American Almanac for the year 1878. By Ainsworth R. Spofford, Librarian of Congress. Published by the American News Company.

This volume is a compilation of many interesting and valuable statistics concerning the elections, population, imports, land grants of the United States, vital statistics, &c. A few papers on the capital of the United States, the age of notable people, free homesteads on the public lands, and a brief history of almanacs vary what would otherwise appear an appalling array of figures.

Our Merchant Marine. By Chas. S. Hill. Third Edition.

A short pamphlet full of statistical information on a branch of industry which is but slowly recovering, for a fostering care of which the author earnestly pleads.

Errata.—Our correspondent, T. T. M., calls our attention to some errors in his letter on "Some Virginia Mineral Deposits," in our issue of Feb. 28, page 5, which he wishes us to correct. On line 32, for "below the Dora coal mines" read "in the vicinity of the Dora coal mines;" on line 10, third column, for "5,992,788 acres" read "5,992 778-1000 acres;" on line 53, third column, for "the iron ore here lies in a stratified bed," &c., read "the iron ore bearing rocks lie in a stratified bed," &c.

Coal by the Cubic Mile.—The *Nautical Gazette* says: "During the last year the output of coal in the British Islands amounted to 132,000,000 tons. A popular notion is that a great part of the crust of the earth is becoming used up by mining operations, and that if the soil that has been dug out of our mines were piled up it would make a great mountain range; let us, therefore, reduce this to figures also. A cubic mile is equal to 147,198 millions of cubic feet, and allowing 29½ cubic feet of coal in the solid to weigh a ton, we get just 5,000,000,000 tons of coal in one cubic mile, and this is a greater weight than all that has been raised in the British Islands. According to the most reliable statistics, the end of 1878 will about just complete the first cubic mile of coal, exclusive of waste in mining. If our fuel had been stored in mountain heaps on the surface instead of being buried in the bowels of the earth, a very small mountain range indeed would have been equivalent to all the coal fields available to man in the whole of our earth." The error in this calculation is that the figures of coal production do not include the culm, slate, rock and other mine refuse raised with the coal. We cannot, therefore, measure the area of the holes made in the earth's crust by the tonnage of merchantable coal raised. It is true, however, that the quantity of coal and refuse annually excavated is much less, measured in cubic feet, than is commonly supposed.

American Exhibitors at Paris of Metals, Hardware, Manufactures of Metals, &c., &c.

From the official list of exhibitors who have secured space in the American Department at the Paris Exposition, we select the following names of those who will show goods of interest to our readers:

A.

Abbey, Chas., & Sons, Phila., gold foil.
Abendroth Bros., New York, stoves.
Adams & Taggarts, Pittsburgh, Pa., machine for paper bags.
Adriance, Platt & Co., New York, mowers and reapers.
Aiken & Drummond, Louisville, molding machine.
Aikin, Lambert & Co., New York, gold pens, pencils, &c.
Albert, Chas. F., Phila., musical instruments.
Albright, Andrew, Newark, N. J., rubber-coated harness trimmings.
Allen & Roeder, New York, pneumatic boiler riveting machines.
American Buttonhole Overseaming Sewing Machine Co., Phila., sewing machines.
American Fence Mfg. Co., N. Y., fence.
American Society of Civil Engineers, New York, plans and models engineering works.
American Vulcanizing Wood and Lumber Co., New York, vulcanized wood.
American Watch Co., Waltham, Mass., watches and watch movements.
Ames, Oliver & Sons, North Easton Mass., shovels.
Andrews, Wm. D., & Bro., New York, pump and engine.
Ansonia Clock Co., New York, clocks.
Auburn Mfg. Co., Auburn, agricultural tools.
Aultman, C., & Co., Canton, Ohio, agricultural machines.

B.

Baeder, Adamson & Co., Phila., emery, &c.
Bagger, Louis, Washington, D. C., glass bearings.
Bailey, Leonard & Co., Hartford Conn., hand tools.
Bailey Wringing Mach. Co., N. Y., wringers.
Baker, J. R., Anti-Friction Metal Co., New York, anti-friction metal.
Banner, Geo. E., and Anna G. Fales, New York, steam engines.
Barney & Berry, Springfield, Mass., skates.
Barnum, Richardson & Co., Lime Rock, Conn., car wheels, iron, ore.
Bastie, A. de La, South Brooklyn, toughened glass.
Baugh & Sons, Philadelphia, sectional mills.
Bausch & Lomb, N. Y., optical instruments.
Bay State Rake Co., Winchendon, Mass., hay rake.
Bevin Bros., East Hampton, Conn., bells.
Bickford & Huffman, Macedon, New York, seed drill.
Blake Crusher Co., New Haven, Conn., stone and ore crusher.
Bliss & Williams, Brooklyn, machine for working sheet metal.
Boyd & Chase, N. Y., Washita oil stones.
Bracher, T. W., New York, ventilators.
Bradley, Mrs. M., Morrisania, lunch heater.
Brewster & Co., New York, carriages.
Brill, J. G. & Co., Philadelphia, street car.
Brooks, Ezra, Hartford, Conn., automatic pumps.
Brown, A. & F., New York, fog trumpet.
Brown Caloric Engine Co., New York, caloric engine.
Brown, Hinman & Co., Columbus, garden and farming tools.
Brown & Sharpe Manufacturing Co., Providence, R. I., machine tools.

C

Chadborn & Caldwell, Newburg, agricultural implements.
Cleveland Paper Box Mach. Co., Cleveland, machine for making paper boxes.
Coates, A. W., & Co., Alliance, Ohio, grain rake.
Collins & Co., Hartford, Conn., axes and edge tools.
Collins & Co., Hartford, Conn., plows.
Colt's Patent Firearms Co., Hartford, Conn., firearms.
Copeland, Geo. W., Boston, machine for lasting boots and shoes.
Cortland Wagon Manuf'ng Co., Cortland N. Y., wagons.
Coston, Martha J., Washington, D. C., night signals.
Crane Bros. Mfg. Co., Chicago, malleable iron fittings.
Cresson, Geo. V., Philadelphia, shafting.
Cresson, Geo. Vaux, Philadelphia, shafting and bearings.

D.

Darling, Brown & Sharpe, Providence, R. I., hand tools.
Daughaday, J. W., & Co., Philadelphia, printing presses.
Davis, Jno. G., & Son, Philadelphia, wheels, spokes, hubs, &c.
Davis, J. W., Washington, D. C., elevating signal tower.
Davis, Wm. J., Philadelphia, anchors.
Day, Austin G., New York, Kerite insulated telegraph wire.
Dederick, P. K., & Co., Albany, hay press, horse-power bale tie machine.
Deere & Co., Moline, Ill., plows.
Delamater, C. H., & Co., New York, shearing and punching machines.
Devens, Henry, Battleboro, Vt., automatic screw machines.
Disston, Henry, & Sons, Racine, Wis., saws and files.
Dixon, Jos., Crucible Co., Jersey City, graphite, pencils, crucibles, &c.
Doty, H. H., Washington, D. C., lighthouse and other lamps.
Douglas Ax Manufacturing Co., Boston, axes and edge tools.
Douglas, W. & B., Middletown, Ct., pumps.
Dover Stamping Co., Boston, egg beater.
Dudley, P. H., New York, plan showing power moving railroad trains.

E.

Eagle Mowing Machine Co., Albany, mowers and reapers.
Eames Vacuum Brake Co., Watertown, New York, vacuum brakes.
Edison, Thos. A., Menlo Park, N. J., telegraphic instruments.
Edson, M. B., New York, recording and alarm gauge.
Edwards, W. Young, N. Y., metallic lasts.
Ervien, Chas., W., Phila., steam engines.

F.

Fairbanks, E. T., & Co., N. Y., scales.
Fairchild, Leroy W., & Co., New York, gold pens, pencils, &c.
Fales, Thos., J., agent, New York, Baxter portable steam engine.
Farmers' Friend Manufacturing Co., Dayton, Ohio, grain drill.
Farquhar, A. B., York, Penn., threshing machine, horse plows, rakes, &c.
Fay, J. A., & Co., Cincinnati, wood-working machinery.
Field, A., & Son, Taunton, Mass., tacks.
Flanders, L. B., Phila., planing machine.
Funck, Jos., Staten Island, lighthouse and other lamps.

G.

Gale Mfg. Co., Albion, Mich., plow and hay rake.
Gally, Merritt, New York, printing presses, speed regulator and telegraph instruments.
Gatling Gun Co., Hartford, Conn., guns.
Gleason, E. & F., Philadelphia, wood-working machinery.
Globe Horse-shoe Nail Co., Boston, horse-shoe nails.
Goddard, Curtis, Alliance, O., corn sheller.
Goff, Lyman B., Pawtucket, R. I., package carrier.
Goodwin, Wm. F., Stelton, N. J., mowing machine.
Goodyear & McKay Sewing Machine Co., New York, boot and shoe machinery.
Gould's, M., Sons, New York, stair rods.
Grandperret, L., N. Y., mechanical toys.
Gray, Elisha, Chicago, speaking telephone.
Green, David C., N. Y., feed-water heater.
Green, S. W., New York, type-setting and distributing machine.

H.

Hagstoz & Thorpe, Philadelphia, watch cases and pliers.
Hancock Inspirator Co., Boston, inspirator or compound injector.
Harrington, E. & Son, Philadelphia, screw hoisting machine.
Hayes, Geo., New York, patent sky lights.
Henis, Charles F., Philadelphia, lock elbow for stove pipe.
Hercules Lever Jack Co., Newark, lever jack.
Herring, Farrell & Sherman, N. Y., safes.
Hill's Archimedean Lawn Mower Co., Hartford, Conn., lawn mowers.
Hines & Ginna, New York, oil tank.
Hoopes Bros. & Darlington, West Chester, Pa., wheels, spokes, hubs, &c.
Hoopes & Townsend, Philadelphia, bolts, nuts and rivets.
Howard Mfg. Co., Belfast, Me., mitering machine.
Howe Scales Co., Rutland, Vt., scales.
Hunter, Keller & Co., N. Y., gas fittings.

I.

Iden & Co., 194 Hester street, New York, gas fixtures.

J.

Jamison, S. W., New York, boot and shoe machinery.
Johnston Harvester Co., Brockport, N. Y., mowers and reapers.
Jones, Owen, Philadelphia, revolvers.
Justi, H. D., Philadelphia, dental instruments and appliances.

K.

Knapp Dovetailing Machine Co., Florence, Mass., dovetailing machine.
Kroeber, F., New York, clocks.

L.

Laflin, J. M., N Y., parlor rowing appar's.
Lalance & Grosjean Mfg. Co., New York, sheet metal ware.
Landis, Ezra F., Lancaster, portable forge.
Lechner Mining Machine Co., Columbus, coal mining machine.
L. W. Leeds & Co., New York, plans for ventilating and warming.
Lobdell Car Wheel Company, Wilmington, car wheels and rolls.
Lovegrove & Co., Philad'a, steam engine.
Lovell, John P., & Sons, Boston, air guns and pistols.

M.

McCormick, C. H. & L. I., Chicago, mowers and reapers.
McDonald, Jas., Williamsport, piano.
McShane, H. & Co., Baltimore, bells.
Mallory, Wheeler & Co., New Haven, hardware, locks, &c.
Markt & Co., New York, horse rakes, forks, shovels and hoes.
Mason, Volney W. & Co., Providence, clutch pulleys.
Matthews, J., N. Y., soda water apparatus.
Mayer Bros., New Orleans, cigar-making machine.
Mersereau, Wm. T. & J., Newark, stair rods, &c.
Morse Twist Drill and Machine Co., New Bedford, Mass., twist drills.
Myers, A. G., N. Y., plumbers' materials.

N.

Nason Manuf'g Co., N. Y., universal pump.
Nathan & Dreyfus, N. Y., lubricators, &c.
National Car Spring Co., N. Y., car springs.
New Haven Wheel Co., New Haven, Conn., wheels, spokes, hubs, &c.
Northampton Emery Wheel Co., Leeds, Mass., emery wheels.
Northfield Knife Co., Northfield, Conn., pocket cutlery.
N. Y. Plate Printing and Engraving Co., New York, power press.

O.

Ohio Tool Co., Columbus, hand tools.
Open Stove Ventilating Co., N. Y., stoves.
Osborne, C. S., & Co., Newark, saddlers' and harness-makers' tools.
Osborne, D. M. Mfg. Co., Auburn, mowers and reapers.
Oscillating Pump Co., New York, pumps.

P.

Packer, Chas. W., Philadelphia, card-cutting machine, ice-cream freezer.
Pancoast & Maule, Phila, gas-pipe cutter.
Parent, Chas. E., New York, glass castors.
Pennsylvania File Works, McCaffrey & Bro., Philadelphia, files.
Peters Combination Lock Co., Waterbury, Conn., locks.
Philadelphia & Reading Coal & Iron Co., Philadelphia, locomotive, coal and iron manufactures.
Phillips, W. V. & Co., Providence, R. I., fringing machine.
Pickering, T. R. & Co., Portland, Conn., steam engine governor.
Pond, C. H., New York, electric gas lighting machine.
Providence Tool Co., Prov., R. I., firearms.
Pullman Palace Car Co., Chicago, model of sleeping-car.

R.

Randolph Theo. F., N.Y., ditching machine.
Rathbone, Sard & Co., Albany, stoves.
Reading Hardware Co., Reading, hardware.
Redlich Mfg. Co., Chicago, faucets.
Reed Jno. Van D., New York, canvas hose and circular loom.
Remington E. & Sons, Ilion, N.Y., firearms.
Richards, Chas. B., Hartf'd, Ct., indicators.
Robinson, S. E., Newark, wrenches, braces.
Rockland Nickel Mining Co., New York, nickel and products.
Rogers, C. B. & Co., Norwich, Conn., saws and planer.
Rosetti, Francesco, New York, row-lock.
Rubber Cushioned Axle Co., New York, rubber cushioned axles.
Rubber Step Mfg. Co., Boston, carriage steps.
Russell & Erwin, New Britain, Ct., hardw.

S.

Sargent, E. K., jr., Newark, boiler detergent.
Schlesinger, Leo & Co., N. Y. mech'l. toys.
Schuttler, Peter, Chicago, wagons.
Seidle, F., Mechanicsburg, Penn., wheels, spokes, hubs.
Selleck, O., N. Y., machine for embroidering.
Seward, M. & Son, N. H. Ct., carriage hardware.
Sharps Rifle Co., Bridgeport, Ct., firearms.
Sheble & Fisher, Phila., forks and drags.
Sherwood, P. M., N. Y., bottle filling mach.
Shriver, T. & Co., N. Y., copying presses and piano frames.
Smith & Egge Mfg. Co., Bridgeport, Conn., locks and chains.
Smith, Wm., San Francisco, water-closets.
Snell Mfg. Co., Fiskdale, Mass., augers, bits.
Snyder & Bro., N. Y., steam engine.
Speer, Alex. & Sons, Pittsburg, plows and cultivators.
Stanley Rule & Level Co., New Britain Ct., rules and levels.
Stephens' Pat. Vice Co., N. Y., vices.
Stephenson, John & Co., N. Y., street cars.
Stevens Co., J. & E., Cromwell, Ct., iron toys.
St. Louis Stamping Co., St. Louis, sheet metal and ironware.
Stoddard, J. W. & Co., Dayton, ag'l. imp.
Stow Flexible Shaft Co., Phila. flex. shafts.
Striedinger & Doerflinger, Brooklyn, model of blast. apparatus.
Stratton & Cullum, Meadville. Pa., hay loader.
Studebaker, Bros., South Bend, Ind., wagons.

T

Tatham & Bros., New York, shot.
Taylor, B. C., Dayton, hay rake.
Taylor Manufacturing Co., Westminster, Md., portable engines.
Taylor, Robt., Phila., crucibles and retort.
Tiffany & Co., New York, silver ware and jewelry.
Tower, John J., N. Y., locks, wrenches, &c.
Trump Bros., Wilmington, scroll saws.
Tuchfarber, F. & Co., New York, enameled iron signs.
Type-Writer Co., N Y., type-writing mach.

U

Union Metallic Cartridge Co., Bridgeport, cartridges.
Universal Peace Union, Phila., peace plow.
U. S. Regulation Fire Arms Co., New York, Springfield muskets,
U. S. Wind Engine and Pump Co., Batavia, windmills.

V

Victor Sewing Machine Co., Middletown, drill chucks and micrometer calipers.
Von Hoven, Louis, New York, check register.

W

Walter A. Wood Mowing and Reaping Mahine Co., Hoosick Falls, N. Y. mower and reaper.
Walton Bros., New York, lanterns, &c.
Warder, Mitchell & Co., Springfield, Ohio, mowers and reapers.
Warren John, Detroit, spring motors.
Waterbury Button Co., Waterbury, Conn. buttons.
Welsh & Lea, Philadelphia, carriage hard ware.
Westinghouse Air Brake Co., Pittsburgh, Penn., atmospheric brakes.
Weston Dynamo-Electric Machine Co., Newark, electro-plating apparatus.
Wharton, Joseph, Philadelphia, nickel and cobalt ores and products
Wheelock, Jerome, Worcester, Mass., steam engine.
Wheeler, Wm. F., Philadelphia, disinfecting apparatus.
Wheeler & Wilson Mfg Co., New York, sewing machines.
White, Samuel, S., Philadelphia, dental instruments and appliances.
Whitney, A., & Sons, Phila., car wheels.
Whiton, D. E., West Stafford, Conn., lathe chucks and gear cutters.
Wiley & Russell Mfg. Co., Greenfield, Mass., screw plates and friction pulleys.
Williams, David, New York, books, &c.
Williams, R. S., New York, gold foil.
Wilson & Blye, New York, oil tank.
Withington & Cooley, Mfg. Co., Jackson, Mich., garden and farming tools.

Y.

Yale Lock Co., Stamford, Conn., post-office locks.
Yvard, August, New York, scientific toys.

In addition to the names given there are about 400 American exhibitors of textile fabrics, wines and liquors, jewelry, toys, books, produce, food preparations, clothing, leather, confectionery, chemicals, paints and varnishes, tobacco, oils, medicinal preparations, musical instruments, &c. If all who have been allotted space make as good a showing as they can, the American department will be interesting and creditable. Our iron and steel industries will be slimly represented, but a good showing of hardware, machinery, agricultural implements, &c., is promised.

A Franco-American Treaty of Commerce.

We have received the following appeal of the French committee to the people of the United States.

Citizens of the United States of America: At present no treaty of commerce exists between France and the United States. The absence of any such treaty is equally prejudicial to both countries. It is important, therefore, to bring about a modification in the existing state of things, and, if possible, to convert, for the more ready interchange for our respective products, the general tariff into a conventional one, which should be rendered acceptable to all parties interested prior to its ratification at Washington and Versailles.

A committee for the purpose of stipulating the bases upon which such a treaty should be drawn up has been formed at Paris, and we would now request of you to organize in the United States a like committee, which would at once enter into communication with us on the subject. The co-operation of these two committees might then, without loss of time, so combine their efforts as to prepare the way for a Franco-American Congress, to be held in Paris during the Exhibition of the present year. After careful investigation and close discussion by the congress of the whole question, resolutions might be adopted and submitted with a higher degree of confidence to the governments and parliaments of France and the United States.

From that moment the part we shall have been called upon to enact will be at an end. Much will, however, remain for us to accomplish, in view more especially of awakening public attention to the necessity of promulgating a law which, while better ministering to the wants of the two nations, would finally assume the form of an international agreement.

Our interests, although in reality identical, are rendered antagonistic by existing legislation. On what ground will it be possible to reconcile them? While not attempting any absolute solution, or the use of means involving sudden and radical changes, we have hopes to attain our end by the advocacy of a more practical measure, viz., that offered by a gradual reduction of tariff rates.

Mr. Sherman, your minister of finances, has, moreover, taken this view of the question, a view which, we trust, will be acceptable to all. The sixth report of the commission appointed by Mr. Sherman for the purpose of modifying the custom house duties of the United States, show that out of more than 2500 articles rated, 823 pay ad valorem duties averaging from 10 to 75 per cent., 541 pay specific duties, 144 pay taxes of various sorts, and 1000, although not enumerated, are always liable to certain dues.

These 2500 articles do not yield to your public treasury as much revenue as you would be justified in expecting from 15 to 20 articles less heavily rated. Such is the conclusion at which the report seems to point.

The Sub-Committee of Ways and Means of the House of Representatives at Washington, was doubtless actuated by the same conviction when it promised to modify your tariff so as to favor the importation of European goods into the States and put new life into your export trade.

Such action on the part of Mr. Sherman and the sub-committee of Congress, in favor of a diminution of custom house rates, show that facts have enlightened the Republic of 1776.

For over a century the current of emigration flowed without abatement toward your shores. Of late, however, the tide has slackened, and it decreases annually. Have you not been compelled to admit that, within the last few years, many an emigrant has gone back to Europe, in consequence of his not being able to find proper remuneration for his labor in the United States?

How comes it that, in the midst of any amount of work waiting to be accomplished, no work is done, when capital abounds in your midst? Whence is the evil?

Your answer may be that crises have alarmed the United States at times when custom house rates did not reach an unreasonable limit. You must perforce acknowledge, however, that the tariff which obtains to-day has in a great degree contributed toward and aggravated your sufferings.

Did you reflect on the depressed state of industry in America, you would at once see that heavy taxes are always paid by the consumer.

The mean average of custom house rates being 40 per cent in the United States, and constituting a prohibitory tariff, why hesitate to seek with us the possibility of opening to yourselves anew those markets of the outside world which too rigorous legislation has closed to your energy and exertions?

You can no longer say: To buy an article in France is tantamount to encouraging French industry at the expense of home industry, and is doing an injury to one's country.

You have long since admitted the fact that a barrel of Bordeaux wine, when unloaded on the wharf at New York, at once causes the purchase of a sack of corn or a barrel of petroleum. The products of each country are rendered more easily interchangeable, and every sale provokes a corresponding purchase.

If the Sub-Committee of Ways and Means of the House of Representatives at Washington obtains from Congress the custom house reforms it recommends, France will have no guarantee against the possibility of a subsequent increase of rates; for, if to-day you lower your duties, you may think it advisable to raise them to-morrow. Has not your tariff been remodeled some 40 times since 1789?

And supposing that your legislators should maintain, even for a lengthened period, the admitted reductions, their faith in respect to the future would in no wise remove the obstacle offered by the general French tariff. Our tariff, in fact, prohibits, in the most absolute manner, the entrance into France of your cotton and most of your woolen staples, such of your cast-iron products as do not belong to a particular category, your wrought iron and most of your works in metal, your refined sugar, your varnished or dyed leathers, &c.

A conventional tariff, while regulating your interests and our own, would bring to the two great republics that security which quickens energy and encourages enterprise on a large scale.

Such treaty cannot prove obnoxious to France and the United States if private initiative first determine the bases which the Paris Congress will be called upon to construct.

Let us therefore mark out a common line of action, and endeavor by co-operation to facilitate the task alloted in last resort to the parliaments of both countries.

And you, on your side, give us the tangible proof that our voice finds an echo on the other side of the Atlanic, and that you accept—by the formation of a central American committee in you midst—our offer to cement a more substantial and enduring link than that which has for some time past existed in our relations of trade and amity.

Paris, February 3, 1878.

President—Menier, manufacturer, member of the Paris Chamber of Commerce, representative of the department of Seine-et-Marne in the Chamber of Deputies.

Vice President—L. Hiélard, president of the general syndicate of the Union Nationale du Commerce et de L'Industrie.

Treasurer — Alfred Kœchlin-Schwartz, manufacturer.

Delegated Member—Léon Chotteau, publicist.

Secretary—Edmond Dutemple, publicist.

Members—F. Barbedienne, president of the union of bronze manufacturers of Paris; Emile Brelay, manufacturer, representative of the department of Seine in the Chamber of Deputies; Courcelle-Seneuil, economist; Dietz-Monnin, manufacturer, ex-deputy, director of the French section at the Exhibition of 1878; Léon Droux, civil engineer; Pascal Duprat, representative of the department of Seine in the Chamber of Deputies; Henri Fould, commission merchant; E. de Girardin, editor of the French political organ *La France*, representative of the department of Seine in the Chamber of Deputies; Yves Guyot, editor of the French political organ *Le Bien Public*; Adolphe Houette, president of the Paris Chamber of Commerce; Oscar de Lafayette, senator; Edouard Laboulaye, member of the French Institute, senator; Laisant, representative of the department of Loire-Inferieure in the Chamber of Deputies; Laurent-Pichat, senator; Levois, member of the Paris Chamber of Commerce; Gustave de Molinari, corresponding member of the French Institute, connected with the *Journal des Débats*; Maurice Rouvier, represenative of the department of Bouches-du-Rhône in the Chamber of Deputies; Scheurer-Kestner, senator; Charles-Maurice de Talleyrand-Périgord; P. Tirard, representative of the department of Seine in the Chamber of Deputies; Wilson, representative of the department of Indre-et-Loire in the Chamber of Deputies.

Budke's Patent Keys, Buckets and Measures.

Messrs. Lewis, Dalzell & Co., of Pittsburgh, have recently added to their list the manufacture of sheet iron measures, buckets, paint, putty and white lead pails and powder kegs under patents of John F. Budke, whose services they have also secured. These articles are made entirely of sheet iron. The measures are claimed to be superior to any measures now manufactured, there being no liability to shrinkage of bottom and falling off of hoops, an objection strongly urged against the wooden measures. They are made with heavy iron band around the top, which keeps the measures stiff and in proper shape. There is a chime on the bottom, serving the double purpose of a handle and to keep the bottom from striking in the ground. Their buckets are made either painted or galvanized, with strong ears and heavy bail, especially desirable for steamboat, mill and factory purposes, as well as being an excellent house and stable bucket. One of these buckets will outwear a dozen wooden buckets. The well bucket is galvanized, being lighter than the ordinary wooden bucket and more durable. The ears are put on in a manner that insures the overturning of the bucket upon striking the water.

Iron packages for gunpowder are fast supplanting the wood keg, and there are several points of superiority in the Budke patent over others. We are informed that Messrs. Lewis, Dalzell & Co. are busily engaged in executing orders for several leading powder manufacturers, who are highly pleased with them. They expect shortly to add to their machinery, when they will be able to execute large orders with promptness. Their pails for putty, white lead and mixed paint are also being used by several of the leading manufacturers of those goods, who appreciate the fact that ere long consumers will refuse to purchase paints and putty when put up in wooden packages, as it is well known that the oil is taken up by the wood or escapes through the joints, thus rendering the lead or paint hard and worthless.

By the use of the iron package the oil is retained and the contents preserved in good condition. These advantages should be sufficient to decide all manufacturers to adopt the iron package. The cost of this package will be about the same as the wooden ones. Their improved dripping pan has already reached a large sale and is recognized as a staple among the largest hardware and stove houses of the country. Their trade in this specialty extends over the entire country.

The International Navigation Company (Red Star line) has just completed a contract with the Barrow Shipbuilding Company, of Barrow, England, to build two new iron screw steamships, 400 feet long, 40 feet beam, 4000 tons measurement, with four masts, and accommodations for 120 cabin and 1000 steerage passengers. They will have inverted cylinder, direct-acting compound engines, with an average power of 12 knots; will receive the highest class in the English Lloyd's and French Veritas, and are expected to be inferior to none as passenger or cargo-carrying vessels. They will run between New York and Antwerp and be finished in a year.

INDUSTRIAL ITEMS.

MAINE.

The Evans Rifle Company, at Mechanic Falls, while hurrying up to fill an order for 3000 rifles, received on Friday last an order for 5000 more. The works are now turning out about $2000 worth of rifles per day.

The Kennebec Wire Works, at Hallowell, are running in full force with many orders on hand.

NEW HAMPSHIRE.

A new company called the Wadleigh Plow Company, has been formed for the manufacture of the granger hillside plow. This plow is said to have novel points of merit.

VERMONT.

The Fairbanks Scale Company have prepared an exhibit of scales for the coming world's exposition at Paris, comprising many modifications, finished up in handsome style and ornamented with appropriate designs and emblems. The exhibit will be more choice and more extensive than at Philadelphia two years ago. A representative of the concern has already gone to Paris to make necessary preparations, and members of the firm will follow.

MASSACHUSETTS.

It is now proposed to manufacture chains of a larger size than heretofore at the Gosnold Mills, New Bedford, and for this purpose a furnace is now building at the works which, when completed, will be used to heat bars 2 inches in diameter for making chain links of that size. With the addition of this furnace the chains made will range in size from 3-16 of an inch to 2 inches.

The newly-formed Wamsutta Needle Company, at New Bedford, have leased a two-story brick building, which they will occupy as a manufactory, fitting it up as soon as the machinery now being made is completed.

The Bay State glass house at East Cambridge has been started up by parties who will employ 100 men in the manufacture of bottles, carboys and similar articles.

The Morgan Iron Works, of Lowell, are now executing a contract for fire escapes for the Washington Mills of Lawrence. They have also provided similar improvements for the Duck, Everett and Atlantic mills. Thirteen men are employed in the establishment.

CONNECTICUT.

The Winchester Repeating Arms Company, at New Haven, made 600,000 cartridges in 11 hours the other day.

The stockholders of the Kennedy Manufacturing Company, of Plainville, have sold their stock to the Union Nut Company, of Unionville, for 60 cents on a dollar.

The brass mill at Bristol has shut down for repairs.

The affairs of the Malleable Iron Company, Meriden, are beginning to look up, and what seems to be a very favorable disposition of the present difficulties has been found. A stockholders' meeting was held Wednesday, the 6th inst., in New Haven, and after a careful consideration of all the points affecting the interest of the company and its creditors, it was proposed to reorganize, offering 50 cents on a dollar in stock, and 40 cents on a dollar in notes, payable in six, nine and twelve months. Should this be accepted the liabilities of the company would be so placed that business could be continued to much better advantage than in the past. As this seems the best and easiest solution of a very difficult problem, it will probably be deemed advisable by all interested to accept it.—*Hartford Courant.*

The corporation recently organized at New Britain for the manufacture of malleable and gray iron castings, has taken the name of the Vulcan Iron Works, and will immediately begin the erection of suitable buildings near the factory of the American Hosiery Company. The foundry will be circular and 128 feet in diameter. The moulding room will be 60x70, and the rolling room 30x70. The capital stock is $35,000, divided into shares of $25 each. The stock has all been taken and the directors chosen. The directors have elected H. M. Dates, president, and T. H. Camp, secretary and treasurer.

NEW YORK.

The co-operative foundry at Troy resumed work on Thursday morning last. It had not been in operation since January.

The machinists at Corning & Co.'s works at Troy have just completed the fitting up of another of Supt. Walker's horse shoe machines, which was placed on trial last Friday. This machine is the third of its kind erected here. The machines are capable of producing, on an average, three and one-half tons of horse shoes each per turn's work. Combined with the machine is a patent "swedger," which performs its work as fast as the machine can supply it. As to the quality of the shoes manufactured, competent judges pronounce them to be of a superior kind. Most of the operatives are boys, which fact materially lessens the cost of manufacture.

The fires were started in the Fort Edward Blast Furnace on last Thursday, preparatory to commencing operations again. The furnace had been idle more than a year.

NEW JERSEY.

Bids for supplying iron water pipes during the year for the Mystic and Cochituate departments have been opened by the Boston Water Board, and the contract has been awarded to the lowest bidder, the Warren Foundry and Machine Company, of Phillipsburg, whose bid amounts to $57,506.25.

PENNSYLVANIA.

Messrs. Leibrandt & McDowell, of Moslem, are again receiving a stock of coal for furnace use; they get as high as 25 cars a day. The furnace is reported as making from 14 to 18 tons No. 1 iron every 24 hours. They contemplate putting in an upright hoisting machine at their ore mine in place of the slope hoist now used.

Furnace No. 5, of the Bethlehem Iron Co. has chilled and is being blown out.

The shops of the Oil City Iron Works, Selden, Bliss & Co., with facilities very complete for manufacturing engines, boilers and mill machinery, are especially active in the department of boiler making, and huge boilers are lying about their shops in all stages of progress. Their boilers are tested and inspected by the Hartford Steam Boiler Inspection Co. before shipment, and the purchaser receives a certificate of inspection and a policy of insurance for one year, payable to him and valid wherever the boiler may be located.

The Presque Isle Iron Works (Stearns Manufacturing Company), Erie, are large makers of mill machinery, &c., with improving prospects and present encouragement. These and the brass works of the Jerecki Manufacturing Company are the three largest concerns in Erie engaged in the manufacture of metals.

We clip the following from the Sharon *Herald* of the 8th inst.: At the Westerman Iron Works, puddle and guide mills double turn; bar, sheet and hoop mills single turn; nail factory on three days; chain factory working steadily on orders; blast furnaces working smoothly and even, and making some very fine pig iron and a good lot of it. At the new mill, Kimberly, Carnes & Co., puddle, guide, bar and both hoop mills double turn; nail-plate mill off the whole week; nail factory on three days. At the Keel Ridge Furnace the patent process mentioned last week is still in use. The main idea of the thing appears to be the decarbonization of the iron by oxidation while the metal is running into and before it solidifies in the chills. The fine ore is wet when the metal comes in contact with it, when the nitrogen and hydrogen are eliminated from the ore by the heat of the iron on top of it. It will of course form a steam, which must have vent, and that vent is found through the iron; the hydrogen and oxygen of the ore must, by the laws of gravitation, remain in the iron, and nothing escape but the watery element. The action of these gases on the iron is to keep it in fermentation or boiling until it becomes solid by cooling while such boiling is going on. Oxygen is supplied by nature, and carbon and phosphorus must, therefore, give way before it. Another thing, the entire absence of sand in the pig metal put through this process will materially cheapen the cost of fix in the puddle furnace, because sand is the agent that cuts up the bottom and eats away so much fix. In some mills we know of, a saving in that department alone would be quite an item out of the bill of expenses for one year, and if ore was as cheap as sand it would be a far superior material to use in pig beds. At the Stewart Iron Works everything is working up to the mark. The 1000 tons of blooms were finished last week.

The rolling mill, plate mill and nail factory of E. & G. Brooke, Birdsboro, suspended operations for two weeks for the purpose of making necessary repairs to machinery, &c. It will resume operations on the 18th inst.

The Glendon Iron Company distribute among its employees each month about $40,000. The company has now on hand something over 2000 tons of iron, and is shipping about 120 tons more a day than they manufacture, although the furnaces are being run on their fullest capacity.

The Scottdale Rolling Mill is running single turn.

The rebuilding of the engines of the Pennsylvania Railroad Company which were burned in Pittsburgh during the riots are almost completed. The work is being done in the Pennsylvania Railroad shops at Altoona.

The Wampum Furnace Company, of Wampum, expect to be able to ship 40 cars of coal per day the coming season.

The *Advance-Argus* says the Greenville Rolling Mill is to start up in a few days.

The Etna Iron Works, Newcastle, which started up two weeks ago, single turn, went on Monday, the 4th inst., double turn in every department.

The Phœnix Iron Company have placed a new machine in their works for cutting angle iron, which is said to surpass the cold saw.

PITTSBURGH AND VICINITY.

The firm of Evans & Co., chimney manufacturers, have dissolved, Charles Wenzell and John Wagner retiring. Thomas and David Evans are the remaining partners, under the style of Evans & Co.

Some large plates are now being made of Danks iron at the Millvale mills of Graff, Bennett & Co., John I. Williams, superintendent. They measure 46 feet in length, 48 inches in width and one-fourth inch thick, and are for bridges for the Pittsburgh and Lake Erie Railroad.

The Pittsburgh Forge and Iron Works are now working double turn, the difficulties between the men and the new manager having been settled.

Messrs. Marshall & Bros., elevator builders, on Saturday last paid their employees their week's salary in gold.

The Westinghouse Company of this city have received orders from English, French and Belgian railroads, aggregating one million and a quarter of dollars in gold. The trade in the United States is duller than in former years.

The cupola built by Capt. Jackson on the river bank at Brachy's Bend, on the west side, is doing well. The object is to work up the cinder and waste iron scattered in large quantities over the Bend. The material is abundant. The iron, instead of been cast into pig, is run into grate bars and other articles of utility, which find a ready sale.

Potter, Bell & Co., locomotive builders, are thronged with work, and are taking back experienced mechanics who were suspended some time since. The firm have completed seven locomotives since January 1, two of which were sent to Washington Territory, making an aggregate of five built for that Territory by the firm.

The shipments through the locks of the Monongahela Navigation Company since January and February, 1878, aggregate 17,431,305 bushels of coal and 1,050,100 bushels of coke. The bushel of coal is 76 pounds, and of coke, 40 pounds.

Lewis, Dalzell & Co. have started their works double turn.

The following is the condition at the glass works in and about the city: The Keystone Chimney Works have sold in the four months they have run, 18,000 boxes of chimneys, and are still largely behind with their orders. The O'Hara press house is running steadily. The Pride street house, Richards, Hartley & Co., are also on

full, with encouraging prospects. McKee Brothers are on full, running steadily, and doing well. Jones' works, Southside, are all on full, and doing well. Bakewell's house is also on full. Doyle's works are running full, with good prospects. Ripley's press house is also doing well, and on full. It is stated that Plunkett's glass works on the Southside is to be opened on the 1st of April. The Keystone Works are running steadily, full time, with prospects of continuing all summer. R. C. Schmertz & Co.'s glass works, at Bellevernon, Pa., have orders enough in to keep them filling till spring; orders mostly for double strength. The extension pipe foundry of Wm. Smith was sold last week, the price being $10,000, subject to a mortgage of $17,000. Mr. McCune, as trustee, was the purchaser of both properties.

WEST VIRGINIA.

Messrs. Hervey & Britt, of Wheeling, disposed of twenty shares of Bellaire mill stock on Monday, the 4th inst., at $47.50 per share, the par value being $50.

The *Mountain Herald* says that a Mr. Bramwell has leased and taken charge of the Quinnimont property and that the furnace was to be started last week.

The Superior Mowing Machine Works at Wheeling are running on full time, making stock for the spring trade.

OHIO.

A shovel factory is soon to go into operation at Cleveland, owned and managed by Wm. Chisholm & Sons. The shovel to be manufactured is known as the Lowman patent. The blade is of a single sheet of steel, without seam or rivets. It was formerly manufactured by the American Company and the Birmingham Company of Connecticut. The Birmingham Company bought out the American, and the Messrs. Chisholm purchased the consolidated interests from the Birmingham Company, and now control the manufacture of this shovel, with the exception of privileges held by the Remingtons at Ilion, received prior to their purchase from the Birmingham Company. The factory to be thus occupied was formerly a woolen mill and is fitted with machinery of sufficient capacity to manufacture 125 dozen per day.

The Portsmouth Machine Works are now engaged in casting the machinery for the new boat being built at Ironton, by the Maddy Bros., for the Wheeling and Charleston trade. The cylinders will be 12 inches bore, with 4 feet stroke; the boilers, two in number, of the homogeneous Burgess steel, 70,000 tensile strength, 22 feet in length, 37 inches in diameter, and the flues will be 8 inches in diameter, being lap-welded tubes.

The Sandusky Tool Company, of Sandusky, have added to their business the manufacture of agricultural implements. Among their specialties for this year in this line are the Bruner Patent Walking or Riding Corn Cultivators, the Lockwood Patent Sulky Harrow and the Sandusky Sulky Rake. They have added to their force experienced workmen for the manufacture of these goods.

The Excelsior Manufacturing Company of Cleveland will soon have all of the machinery in place and everything in running order.

The Phenix Iron Works at Ashtabula received on Friday last a new Bradley's cushioned trip-hammer weighing 5000 pounds and costing $600.

W. C. Davis & Co., stove manufacturers, Cincinnati, have leased a large building formerly occupied as a cotton factory in their city, and are going to extend their business by utilizing the whole structure as a stove factory. They will employ 150 moulders, and probably a total force of 400 hands.

Warder, Mitchell & Co., manufacturers of agricultural implements, Springfield, report a large number of orders for next season. They make the celebrated reaper and mower called the "Haymaker."

The Hubbard Iron Company's Furnace has been stopped for repairs, and expects to start up in two weeks.

The Niles Boiler Works are running full time.

The Falcon Iron Works, in Niles, have resumed operations, after remaining idle six weeks.

The Martin's Ferry *News* says: At present there seems to be small chance of the Ohio City Nail Mill being started at any definite time. We learn that a company was formed for the purchase of the property, but the parties cannot agree as to the title, the purchasers demanding a warrantee deed, while the bondholders propose to give such title as they received from the special master commissioner. The difference may, and we hope will, be arranged, but at present matters look unpromising, as the present owners, not being practical iron men, have no desire to open the mill.

Messrs. Thomas R. Butman & Co., of Dayton, are putting in, for Messrs. Corning & Co., of Cleveland, Butman's patent furnace doors and patent setting for two boilers. The firm has also received a contract from Messrs. Higbee & Co., of Bellevue, for doing similar important work.

KENTUCKY.

All of the departments of the Norton Iron Works, at Ashland, are idle. Work on the furnace is progressing finely; part of the boiler stack will be torn down and rebuilt making it higher than before.

IOWA.

An iron fence factory is to be established at Dubuque.

ILLINOIS.

The Northwestern Horse Nail Company, Chicago, have recently added new nail machines for making plate nails, and are now turning out these nails in Nos. 2 to 4.

The Baldwin Locomotives for Russia.

—The steamer Timor, laden with 26 locomotives, built by the Baldwin Locomotive Company for the Russian government, sailed on the 9th inst. Each locomotive is stowed away in pieces and will be put together by mechanics who went on the steamer for that purpose. The steamer Wyckham, with the balance of the locomotives to complete the order, sailed on the 10th. The Timor accidentally ran aground while off the lower end of Windmill Island, but got off at high tide late in the afternoon.

Iron Interests in Southwest Virginia.

Pulaski county is situated in Southwest Virginia. It is divided nearly in half by the Atlantic, Mississipi and Ohio Railway. The county town, Newbern, is a station on the road, and is about 93 miles from Bristol, on the Virginia and Tennessee line. We propose to give a sketch of the iron and general mining business of this county, as at present situated. We may premise our notes with the information that the furnaces mentioned are all charcoal, and that the iron they have heretofore produced has had a very good reputation among blacksmiths, boiler makers, machinists and founders.

Radford Furnace is 8 miles from Dublin station, on the A. M. and O. Railroad, and 1 mile from New River. Capacity, 8 to 10 tons of pig per day. It has turned out 12 and 14 tons; steam power. Ores are abundant, convenient, easily mined and close to the furnace. The furnace has been idle since the autumn of 1874. No preparations are being made to put it in blast; no stock on hand. The property, including a large timber tract, belongs to a company composed mostly of Pennsylvanians.

Five miles west of Radford are Graham, Robinson & Flanagan's lead mines, which are on New River, and are now being developed. Two paying veins of lead and zinc ores have been found, and others are being prospected for. This is a new enterprise and promises well. The ores are unusually rich and very easily mined.

West one mile from the lead mines is situated D. S. Forney & Co.'s forge, a half mile north of New River. This is a new forge; has two heating fires. Bar iron of superior quality is turned out from ores found in the neighborhood, 500 to 600 pounds being the daily product.

Three miles west of Forney's is Barron Springs Furnace, owned by Dr. J. W. McGavock. Capacity 5 tons per day; steam power; out of blast last year; will not go in this year; no stock on hand. Situated 12 miles from railroad.

Three miles west of the last-named location is Cedar Run Furnace, owned by D. P. Graham, Esq. Water power; out of blast since 1873; will not blow this year; no stock on hand.

North of Cedar Run Furnace three miles, on Reed Creek, is Graham forge, rolling mill, nail factory and merchant mill. Very little doing at these works. The three forge fires are operated part of the time, making blooms which are rolled into horseshoe and other irons for neighborhood use. No nails are being made. The works are operated by water power; are in good repair, but much of the machinery should be replaced by more modern makes.

Three miles west of Cedar Run Furnace is Walton Furnace, owned by Howard & Landen. Capacity 5 to 6 tons per day; steam power; idle since 1873; no preparations making to blow; 5 miles from the railroad.

Two miles south of Walton, on New River, is situated the Wythe Union Lead and Zinc Company's works. This is an old establishment, and is operated on a pretty large scale, turning out considerable quantities of pig and bar lead and shot, and shipping large quantities of zinc ore to New Jersey. All the products are hauled a distance of 10 miles to the railroad for shipment.

Four miles west of the lead works is Brown Hill Furnace, owned by A. Painter & Sons. This furnace was in blast a short time last year, making some 300 tons of iron. Will not probably blow this year. No stock on hand. Capacity, 5 to 6 tons per day; water power; 10 miles from railroad. Immediately around this furnace considerable quantities of zinc are being mined and shipped to New Jersey.

Four miles west of Brown Hill is Huddle's forge. Three fires are in operation, making boiler plate, &c. Water power is used; 9 miles from the railroad.

A half mile west of Huddle's is Gray Eagle Furnace, owned by Graham & Robinson. Out of blast since 1874. No preparation to go in blast; no stock on hand; water power; capacity, 2 tons per day; 12 miles from the railroad.

One mile west of Gray Eagle is Rouen Cliff Furnace, owned by Crockett, Sanders & Co., capacity 7 to 9 tons; water power. In blast in 1877 and made some 1500 tons of iron. Will probably make a short blast next fall. Most of last year's product is now on hand; 9 miles from the railroad; some 2500 acres of ore and timber land is attached to the property.

Two miles west of the last is Wythe Furnace, owned by Sayers, Oglesby & Co.; not been in blast since 1874. It has been leased by the owners of Rouen Cliff, and will be in blast this year; 8 miles from the railroad; no stock on hand.

Four miles west of Wythe is Porter's forge, owned by Mr. Stephen Porter. Two fires in operation making bar iron from native ores.

Three miles west of Porter's is Speedwell Furnace, owned by Mr. D. E. Jones. In blast a short time last year, making some 350 tons of iron. No preparation is being made to blow this year, and will probably be idle; 8 miles from the railroad.

Six miles west of Speedwell is Panic Furnace, owned by Pierce, Gallagher & Co. This furnace was built in 1872-3; was blown in 1874-5, and has been idle since; 6 miles from the railroad; will not blow this year; no stock on hand; capacity 5 to 7 tons per day.

A gentleman largely interested in this mineral region says: "Out of 10 furnaces in this (Pulaski) county, not more than two and probably only one, will make any iron this year. This is a sad state of affairs. Most of these works are so remote from the railroad that it kills everything to get their iron to market. A narrow gauge road to connect with the A. M. and O. road would open up the entire mineral region of the county a distance of 40 miles, and would certainly in time secure the development of one of the finest iron regions in the country."

We have taken pains to go into detail in order to show how the iron manufacturing business has heretofore been carried on in many parts of the Southern iron region, and also to show how entirely prostrate the old system is, and how completely it has been superseded by new ideas and conditions. Here are hundreds of thousands of dollars in "plant," in the midst of abundance of excellent ores, plenty of cheap timber and the region abounding in fine water powers readily and cheaply applicable. But the whole—or nearly all—of this capital might as well be in Kamschatka for all the good it does or is likely to do for its owners.

The Influence of Wars and Armaments upon Trade.

The London *Iron Trade Exchange* prints the following article which has much solid truth:

There is a disease popularly known as "the wolf in the stomach," which consists in a stoppage of the small mesentric tubes, or lacteals, which should convey the digested food into the blood, and so complete the process of nourishment. But the unhappy victim of this malady, although urged by the cravings of a ravenous appetite, derives little or no ultimate benefit from the food which he eats, but, on the contrary, becomes thinner and thinner, and wastes away to a mere skeleton, till death relieves him from his sufferings In a somewhat similar manner, the industrious merchants and toiling millions of Europe are increasingly becoming painfully aware that, although their efforts were never more strenuous, yet there is, somehow or other, a vast difficulty in obtaining that general degree of success which should accompany their present combined endeavors. There appears to be a consuming "wolf" somewhere, devouring, without return, a large proportion of the results of the labors of the populations.

Great Britain, in the first place, has to deduct from her peoples' earnings more than a million pounds sterling per week to defray the debts of past and the cost of present armaments. One or two administrations have, indeed, talked loudly about retrenchment, and have passed (at a further outlay of many millions) a bill for regulating the promotions and retirements in the services; yet there are still nearly 14,000 officers in the army, of whom 11,000 are on full pay, including more than one general for every regiment! while in the navy there is more than one admiral to every ship!! For years this outrageous extravagance has been protested against. The last administration made some effort to reform it, but after all, the result has been that the dead weight of useless high-salaried admirals and generals still forms a mighty incubus on British taxpayers; consequently prices and wages have to be raised, making materials and food dearer all round, and rendering foreign competition easy; thus, America, with her little army and very few officers, is enabled abundantly to undersell England, even in her own colonies (including distant Australia) in hardware and other manufactures, formerly supplied exclusively by the mother country. Thus, too, Belgium, not weighted as England with a crushing war-debt, can now deliver her iron in London more cheaply than the same metal can be supplied by the Northern or Midland English merchants.

In France many hundreds of thousands of the strongest and ablest men are dead weights upon the community. Added to this, there is the immense taxation caused by the indemnity and debt of the war with Germany. Germany herself has to maintain another million of men under arms, at a grievous cost to the remaining population. Similar burdens are afflicting almost all nations, though some in a less degree than others.

And yet men are wondering as to the causes of depressed trade. Some are calling for free, and others for more restrictive tariffs; but how can there possibly be really free trade, whatever the tariffs, while so many millions of totally non-productive soldiers (more than 7,000,000 in Europe), and such vast expenses on armaments, have to be supported as a first charge upon trade, manufactures and profits? The thing is impossible!

This, then, is a primary cause of the existing depression of home and foreign trade, though, no doubt, there are other and secondary causes, as, for instance, national intemperance. But countries whose populations are widely characterized by temperate habits are being crushed notwithstanding, by the burdens of war and armaments. It is surprising, too, that these burdens are not universally attributed to their real source, although many circumstances should point out the truth even to unthinking minds. The Crimean war, for instance, raised the prices of commodities throughout many districts, and in particular around the shores of the Mediterranean. The American civil war substituted dearness for cheapness, and pinching economy for easy comfort in every State of the Union and Confederacy; and all Frenchmen painfully feel that each meal costs more money and exertion to obtain it than was the case a few years ago, before the great struggle with Germany.

Yet at home and abroad the popular indifference in regard to combined practical efforts to urge Parliament and the government to a policy of disarmament is, under the circumstances, amazing. It is true that much cheering growth of public opinion in favor of non-intervention with foreign disputants has become manifest of late years; but even now there is very little adequate combination among the classes most intimately concerned in the matter—the merchants, traders and workingmen—to secure the obvious means of relieving themselves from the grievous disadvantages which increasingly beset them in consequence of the excessive armaments of Europe. This want of efficient perception on their part is only paralleled by the obtuseness of the parsimonious man, who wondered at the increasing conspicuousness of the ribs of his starving horse. First one remedy was suggested, and then another, until at last he was urged to do what should have been first relied on—"Try corn!"

In like manner, the merchants, manufacturers and working men of this and other countries, should promptly and increasingly combine in effectual political unions, for strenuous resort by their respective governments to proportionate disarmament, habitual non-intervention and more clearly defined international law as a basis for pacific arbitration.

The True American Law for the National Registry of Ships.

We have received from the writer a copy of the following letter, addressed to Hon. Roscoe Conkling, chairman of the Senate Committee on Commerce.

NEW YORK, February 26, 1878.

DEAR SIR: As a ship broker and a man who has made a business study of our steamship-shipping interests for the past 15 years, I respectfully request your attentive consideration of the points herein presented against the repeal or any modification of our registry law as applied to foreign built vessels.

1. There are no steamships which would be useful in our coastwise or foreign-going marine now laid up for sale anywhere in the world, and the old and inferior steamers which would be for sale to us if our registry law were repealed, are British.

2. British steamship proprietors possess a much larger number of navigation routes, and a larger number of vessels, and they do a larger business with them, and they derive an aggregate greater profit from their business, than do any other steamship proprietors. By necessary consequence, therefore, a thoroughly good mercantile steamship is worth more capital, for her earning capacity, under the British flag than under ours or any other, because the British owners, possessing more established first-class steamship routes, have more places wherein to employ first-class ships.

3. Wherever steamships can be most profitably employed, it must, other conditions being equal, cost the most money to build them. I am prepared to name a competent capitalist (American) who will duplicate in this country the steamship Britannic, or Germanic, or City of Berlin, or Scythia, or any other of the largest and best steamships under the British flag, for the amount which the one to be duplicated originally cost.

4. The steamships which British owners desire to sell us if our registry law be repealed are almost exclusively those which have been laid up since the passage of the Plimsoll law, and by virtue of that law. They do not desire to sell us their best class of steamships, because these are all profitably employed, and their equals could be built here as rapidly and as cheaply as in Great Britain.

5. We have no Act of Congress equivalent to the Plimsoll law. But Hon. S. S. Cox, of New York, has reported a bill which is designed, with other just and wise purposes, to "prevent unseaworthy and overloaded ships from going to sea." This bill certainly ought to be passed, and it will very likely become a law. Let us suppose the case that our registry law were repealed and that our shipping merchants had bought all or any of the British steam craft which the Plimsoll law has laid up. Let us connect with this the other supposition that, just when our merchants had paid for these old and, by British law, condemned vessels, Congress should enact a statute equivalent to the Plimsoll law. What would be the result? Simply and inevitably that the vessels already condemned by British law would have been bought by Americans just in time to be condemned by American law. Although we need the equivalent of the Plimsoll law as imperatively as the British required that law, it is manifest that every purpose of public spirit, economy and individual judgment would be outraged by the enactment at or about the same date of a "free ship" law and a Plimsoll law, at the present time especially.

6. There are about $300,000,000 invested in ship-building in Great Britain and about $30,000,000 invested in our country. To establish free trade in ships while we should establish it in nothing else, particularly in view of facts narrated in the foregoing, and to establish free trade in ships in the face of a capitalized interest ten times as large as our own, would be an act of legislation against national well-being which would have no parallel in the history of civilization.

7. The bill to allow the promoters of the Woodruff excursion around the world to register under our flag a foreign-built steamship for their speculation, is the first movement toward a total repeal of the registry law. I trust this Woodruff bill will be rejected by the Senate, not only on account of its large posibilities of future evil, but because there is absolutely nothing in the character or purposes of the speculation which warrants the co-operation of our National Legislature. The New York *Tribune* of February 21 exposed this excursion scheme truthfully, and in such a manner as to show that it is the last concern in the country to merit the most startling and destructive act of special legislation ever attempted in America.

I do not wish to consume your valuable time by a very long letter. But I do pray you and all Americans, whether legislators or not, to ask themselves this simple question: What sort of a "reconstruction of the American mercantile marine" would that be which should come from old and condemned British ships bought by Americans only to become older and doubly condemned Americans ships?

I repeat, I most respectfully and most earnestly pray your attentive consideration alike of this letter and of all that it logically and patriotically suggests. Meanwhile I shall continue to believe that Congress will not repeal, nor in one single instance modify, the registry law. Your obedient servant,

G. M. THOMSON.

More Consular Reports on our Foreign Trade Relations.—Mr. Gerard, the consul at Port Stanley, replies to the trade circular of the Department of State of August last, that the Falkland Islands are without productions or manufactures of any kind save wool, which is exported to some extent to England. The importance of the islands to the trade of the world lies in their being a harbor of refuge and repair for vessels bound to and from Cape Horn, and to whalers and sealers. Seamen of every nationality find redress and relief there through their respective consuls. The Consul at Montevideo writes that while the Argentine Basin is supplied with most of its imports from Europe, and conducts its direct trade with European merchants, the people of that region are strongly predis-

posed in favor of trade with the United States, and are ready to welcome American merchants and buy all they can supply. There are no prejudices to be overcome, and with equal facilities of communication and a favorable tariff the United States would at once secure control of the market of these growing and hitherto underestimated countries. In his annual commercial report to the Department of State, Consul General Turner refers to the loss suffered by the coffee planters of Liberia from the want of proper machinery to extract the coffee berry from the hull in which it grows. At present the berry is hulled by pounding in a common mortar with a pestel, whereby a waste is sustained. The Consul suggests that if American machinists would manufacture a cheap hand-worked coffee huller it might find a ready sale in Liberia. The poverty of the planters precludes the use of steam machinery for the purpose. There is a considerable and growing direct trade in coffee with the United States.

Doubts as to the Benefits of Cheap Iron.

The Philadelphia *North American* prints the following suggestive article which we commend to the consideration of iron manufacturers:

If the Republic were to treble its exports of cotton manufactures to foreign countries, the net result would not be so important to the general national interest as would be the mere restoration of the iron manufacture to the state of activity seen in 1870–71–72. The effort to continue that activity has been made with energy by the domestic establishments, and with such effect that they have held possession of the home markets, and the imports of foreign iron have rapidly diminished. But throughout the whole four years' struggle it has been rendered more and more evident that the iron interest is really the center and pivot of the whole national progress, and that whatever injures the former seriously affects the latter. Hence when the iron manufacture was crippled by the railway crash all attempts to start prosperity by other means proved abortive.

To the mind of the average American free-trader it was clear that the main object ought to be to cheapen the cost of iron. But now that iron is cheap and has been so for four years, the times are shockingly bad, and the free-trade philosophy is out of joint. Instead, however, of recognizing the force of this lesson, the free traders want iron to be cheaper still, ignoring the fact that it is the want of an adequate market that makes low prices and not merely the tariff rates. A reduction of the latter might shift a larger portion of the home consumption to the foreign product, but would not increase the demand for iron beyond the present range. All that could be done by contraction to cheapen prices and values has been done. All that low prices could do to quicken trade has been tried. But in this case, as in so many others, it has been discovered that it is the rising market that stimulates trade, as the falling market stagnates business.

If the traffic in cheap iron ruins fifty per cent. of the manufacturing interest, the cheapness benefits the community nothing at all in the aggregate. This has been illustrated in many cases where manufacturers have gone on underbidding each other for large contracts and end with insolvency. What the whole country has been craving for four years past is such a trade as will pay a living profit. The cut-throat policy was a mania begotten of the long-continued contraction; but many persons are now beginning to see that they could much better afford to pay high prices for iron when prosperity was general than they can now afford to pay low prices with the trade generally in a ruinous state. The objections now to anything else than extremely low prices is that the condition of the country will only warrant the latter; but experience demonstrates that the country does not thrive at all on these prices, and the assumption has, therefore, no basis to rest upon. Prices that will afford a living chance to the coal miner, the transporter, the iron miner, the iron mills and the manufacturers of the finished iron products, are the only ones that are natural and wholesome. All others are extreme and ruinous. A large majority of all who have operated for low prices have been crushed by the fall.

For a whole season the price of coal was so low that it did not pay expenses; yet consumption was not stimulated. It is probable that the price of iron has been equally unremunerative; and as the great coal interests have become weakened and impoverished by the process, so the great iron interests have suffered from a similar treatment. When these vast moneyed interests were making handsome profits they used their capital freely to stimulate the general enterprise of the Republic. With that aid all went well and the country was properous; without such aid business staggers along feebly in all directions. Hence the true philosophy of trade is live and let live, and no other is sound.

The Influence of Vibration on Steel.

Hitherto it has almost invariably been assumed that the softer a bar of steel was the more likely was it to endure strains and shocks causing vibration. Steel is a metal of anomalies and surprises, and recent investigations carried out by Mr. W. Metcalf, of the Crescent Steel Works, Pittsburgh, and described in *The Metallurgical Review* for December 1877, appear to show that popular opinion is wrong, and that the hard steels suffer less from vibration than the soft steels. Mr. Metcalf's attention was first called to the matter by the constant breakage of steam hammer piston rods. These, made of ordinary steel, lasted but six months, an iron rod breaking in half that time. Then lower and lower steels were tried and broke in about five months. An accident caused the hurried use of a rod made of comparatively high steel; it was assumed that it would not last more than a week or two, but it actually held out for more than two years. Subsequently a lot of small steel connecting rods were tested in a special machine. The test required was that a machine should run 4½ hours at a rate of 1200 revolutions per minute, unloaded, before the connecting rod broke. These rods were unforged in the middle, and consisted of a piece of straight round bar with a head welded on each end, the middle of the piece being left as it came from the rolls. This explanation is necessary in order that it may be understood that no accident of forging affected the results. "The mode of rupture was," says Mr. Metcalf, "as a rule, the same in all cases; the rod heated at the middle, where the vibrations met, as they were imparted by rotary motion at one end and by reciprocating motion at the other, and by alternating strains of compression and extension. In some cases the rod became slightly red-hot at the middle before rupture. After heating, the next thing observed was the raising or loosening of the surface scale of the middle. Soon after this rupture began, first at the surface and gradually extending to the center, until finally the rupture took place. The breaking was gradual in every case, no piece breaking suddenly, even of the highest steel. The first trial was with .53 carbon steel. Mean time of six trials, 2 hours 9⅛ minutes. Second trial, .65 carbon steel: Mean time of six trials, 2 hours 57½ minutes. Third trial, .85 carbon steel: Mean time of three trials, 9 hours 45 minutes, and the trials were stopped." A set of 12 connecting rods, made from special ingots, was then prepared. These were tested with the following results:

The .30 C. ran 1 h. 21 min. heated and bent before breaking.
The .49 ran 1 h. 28 min.
The .53 ran 4 h. 57 min., broke without heating.
The .65 ran 3 h. 50 min., broke at weld where imperfect.
The .80 ran 5 h. 40 min.
The .84 ran 18 h.
.87 C. broke in weld near the end.
.96 C. ran 4 h. 55 min., and the machine broke down.

From Prof. Thurston's report of the mechanical tests of these steels we have the following:

Carbon.	Ultimate tensile strength, lbs. per square inch.	Extension, ratio to original length.
.30	46,879	.3058
.49	71,653	.115
.53	79,062	.1943
.65	93,404	.19
.80	99,538	.2
.84	108,419	.1783
.87	119,969	.165

The whole twelve were not tested because the machine was needed for other works, and when Mr. Metcalf returned to complete the experiment it was discovered that the foreman of the shop had picked up the unbroken specimens, put them into machines and sent them off. Enough was done, however, to show that the maximum of strength to resist vibration was not found among the ductile steels. Mr. Metcalf gives some other data concerning the performance of steel suspension rods in a bridge that corroborate his views, which are practically novel.

Experiments on Steel Rails.

In the *Organ fur die Fortschritte des Eisenbahnwesens* appears an article on the above-named subject, by M. J. Van Hamel, the following abstract of which is given by the Institution of Civil Engineers:

The experiments were made on steel rails orderded for the Transvaal Republic, and manufactured by John Cockerill & Co., of Seraing. They were of the Vignoles type, weighing 56 lbs. per yard, and of the following dimensions: Hight, 3.9 inches; breadth of foot, 3.9 inches; breadth of head, 2.2 inches; thickness of web, 0.4 inch. Sixteen rails were experimented on, and the tests and results were as follows:

A.—The rail was to be placed on bearings 3 ft. 7 in. and receive a blow from a weight of 1102 lbs., falling freely from a hight of 19 ft. 6 in., without showing a set of more than 1.8 in., and was then to be turned over and straightened back again under similar blows without breaking. The whole of the rails bore this test well, the largest set under the first blow being 2.1 in. They were subsequently nicked in the foot, and then broken by blows of the same weight; the number of blows required varied from one to eight, the last number occurring with a rail which had been a long time under a hot sun, and may thus have been rendered more ductile.

B.—The rail, placed on the same bearings, was to support a weight of 9.8 tons at the center for five minutes without showing any permanent set; and subsequently a weight of 27.5 tons under the same conditions without breaking. The whole of the rails bore both these tests satisfactorily, the permanent sets in the second case varying from 1.97 in. to 4.9 in.

C.—From each charge two small ingots were taken and forged into bars 0.8 in. square, which, when cold, were bent double without breaking, the object of this test being to show that phosphorus, sulphur and silica were not present in an inordinate degree.

D.—Four pieces were cut off finished rails, forged into square bars, and then turned down to four different diameters, 0.59, 0.63, 0.61 and 0.73 in. respectively. These specimens, each 4 in. long, were then tested separately in a hydraulic press for tensional strength. The three first specimens behaved nearly alike, beginning to stretch sensibly at about 22.2 tons per square inch and breaking at about 38 tons per square in., with a final extension of about 18.5 per cent. and contraction at the point of fracture of about 16 per cent. The fourth specimen began to lengthen at about 19 tons and broke at 34.3 tons; but from the fracture it appeared to have been somewhat overheated, and thus not to give a fair test.

The above results show sufficiently the nature of the steel, which belonged to the category called in Belgium "Très tendre" or "Tendre," not capable of hardening in water. These qualities have from 0.18 to 0.20 and from 0.20 to 0.28 percentage of carbon respectively, and were used in this case on account of local circumstances, which did not allow of the quality "demi-dur," which is preferred in Europe. This quality has 0.28 to 0.30 percentage of carbon. The charge of raw material used by Messrs. Cockerill when making this steel is given in detail, and also its chemical composition when melted.

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, March 13, 1878.

Much surprise is felt at home and abroad at the fact that the remonetizing of silver has not had any more effect upon business or values than has yet been noticed. It is pretty well understood, however, among those informed on the subject of finance, that the effects, if experienced at all, cannot be felt for many months to come, with the possibility of such legislation during next winter's session as will arrest any ill effects. Secretary Sherman was before the Committee on Coinage, Weights and Measures on Monday last, and gave his views about the proposed measure for issuing certificates of deposits of silver bullion. In this connection the question was discussed as to whether such certificates should merely represent the bullion at its market value, or whether the government should buy the bullion with the certificates. It seemed to be conceded that certificates should be issued, but the committee came to no conclusion as to details.

Dr. Linderman, the Director of the Mint, at the request of the committee, gave information concerning the facilities for coining the new silver dollar, and said that to double the present capacity would require three additional mints, or two in addition to that at New Orleans. With these, five or six millions a month could be coined. At present, making allowances for interruptions, two millions and a half could be coined a month. This would make thirty millions a year. The New Orleans Mint could be placed in working condition at a cost of fifty thousand or seventy-five thousand dollars, so as to coin one million a month. This added to the coinage of the other mints, would make forty-two millions a year.

During the past week gold has declined to within ¼ of a per cent. of par, and there have been considerable receipts of U. S. bonds from abroad, causing an advance in sterling exchange. The money market is very steady at 4 @ 5 per cent. on call. The discount rate on prime business paper is 4½ @ 6 per cent.

As stated, gold has declined to the lowest point it has touched since it reached ¾ per cent. premium in 1860. The following table shows the daily range of the premium:

	Highest.	Lowest.
Thursday	101¼	101⅛
Friday	101⅜	101¼
Saturday	101⅜	101
Monday	101⅛	100¾
Tuesday	101⅜	100⅞
Wednesday	101⅛	100⅞

The stock market has developed considerable activity, and speculative shares have advanced. The principal dealings have been in Lake Shore, Western Union, St. Paul, Northwest and D., L. & W. We give below the closing quotations of active shares:

Government bonds are active and have advanced ¼ @ ¾ for all issues except 4 per cents and currency 6's. We give below the closing quotations:

The weekly statement of the New York banks shows an increase in the specie average of nearly $4,000,000 and a falling off of a little more than half that amount in legal tender notes. The result on the total reserve is an increase of $1,308,500, and on the surplus reserve an increase of $1,002,875, the latter now standing at about $14,000,000. The following is a comparison of the averages of the last two weeks:

	March 2.	March 9.	Differences.
Loans	$246,456,200	$246,320,800	Dec. $135,400
Specie	33,326,400	37,116,900	Inc. 3,790,500
Legal t'nd'rs	33,137,900	30,655,900	Dec. 2,482,000
Deposits	213,933,400	215,155,900	Inc. 1,222,500
Circulation	19,838,500	19,885,100	Inc. 46,600

The following tables show the foreign trade movements for the week:

IMPORTS.

For week ended March 9:

	1876.	1877.	1878.
Total for week	$5,408,848	$8,258,919	$6,608,089
Prev. reported	60,464,537	53,044,244	49,924,164
Since Jan. 1	$65,873,385	$61,303,163	$56,532,247

Included in the imports of general merchandise were articles valued as follows:

	Quantity.	Value
Anvils	175	$1,484
Brass goods	12	2,476
Bismuth	1	444
Chains and anchors	18	888
Cutlery	104	37,601
Gas fixtures	2	892
Guns	18	5,293
Hardware	7	1,174
Iron, pig, tons	300	4,736
Iron, sheet, tons	6	517
Iron ore, tons	250	478
Iron, other, tons	254	6,047
Metal goods	199	12,681
Nails	15	634
Needles	22	6,988
Old Metal		124
Platina	1	2,966
Per. caps	28	5,517
Saddlery	18	284
Steel	1,208	13,376
Spelter	2,423	201
Silverware	3	145
Tin, bxs	27,130	133,504
Tin, 3,098 slabs	268,182	44,428
Wire	808	5,954

EXPORTS, EXCLUSIVE OF SPECIE.

For week ended March 12:

	1876.	1877.	1878.
For the week	$3,835,594	$4,130,180	$6,438,220
Prev. reported	42,206,373	47,775,350	60,594,691
Since Jan 1	$46,041,867	$51,905,530	$67,032,911

EXPORTS OF SPECIE.

For week ended March 9:

Total for the week	$44,315
Previously reported	2,151,029
Total since Jan. 1, 1878	$2,195,344
Same time in 1877	3,085,177
Same time in 1876	9,066,494
Same time in 1875	14,220,012
Same time in 1874	6,001,731
Same time in 1873	12,061,910
Same time in 1872	3,207,119

Government bonds at the close were quoted as follows:

	Bid.	Asked.
U. S. Currency 6's	118½	119
U. S. 6's 1881 registered	106½	107
U. S. 6's 1881 coupon	106¾	107
U. S. 6's 1865 new reg	104	104⅛
U. S. 6's 1865 cou	104	104¼
U. S. 6's 1867 reg	106⅞	107
U. S. 6's 1867 cou	106⅞	107
U. S. 6's 1868 reg	108⅝	108⅞
U. S. 6's 1868 cou	108⅝	109
U. S. 10-40 reg	104¾	104⅞
U. S. 10-40 coupon	104⅞	105⅛
U. S. 5's 1881 registered	104¼	104⅜
U. S. 5's 1881 coupon	104⅛	104¼
U. S. 4½'s 1891 registered	102⅝	102¾
U. S. 4½'s 1891 coupon	102½	102¾
U. S. 4's 1907 registered	100	100⅛
U. S. 4's 1907 coupon	101	101¼

The following were the closing quotations of active shares:

	Bid.	Asked.
Atlantic and Pacific Telegraph	19⅝	20
Chicago and Northwest	40¾	40¾
" " Pref	69⅛	69¼
Chicago, Rock Island and Pacific	101⅛	101⅜
Chicago, Bur. and Quincy	100⅛	101¼
Col., Chic. and Indiana Central	2⅝	3
Clev., Col., Cin. and Ind	30	30⅜
Cleveland and Pittsburgh	69½	70
Chicago and Alton	68	68½
" Pref	99	100
Consolidation Coal	25	28
Delaware, Lack. and Western	47⅝	47¾
Delaware and Hudson Canal	47½	47⅞
Express—Adams	100⅜	100½
" American	48⅝	49½
" United States	49⅜	49⅞
" Wells, Fargo & Co	86	86½
Erie	10¾	11
Erie Preferred	24½	25½
Harlem	145	150
Hannibal and St. Joseph	10½	11¼
" " Pref	22½	23½
Illinois Central	75⅜	75½
Kansas Pacific	6¾	7
Kansas and Texas	2¾	3⅛
Lake Shore	63⅜	63½
Michigan Central	62¾	63
Morris and Essex	70½	70⅝
Milwaukee and St. Paul	39⅛	39⅝
" " Pref	71⅛	72
Mariposa	1½	2
" Pref	1¾	2¾
New York Central	107½	107⅝
New Jersey Central	15	15¾
New Jersey Southern	1	1¾
Ohio and Mississippi	8¼	8⅜
Pacific Mail	21	21½
Panama	128	131
Pittsburgh and Fort Wayne	90	91
Quicksilver	17¾	18¼
" Pref	30½	32
St. Louis and Iron Mountain	5½	7
St. Louis Kansas City Northern	4¾	5
" " " Pref	22¼	22¾
Toledo, Wabash and Western	15	15⅜
Union Pacific	70⅛	70¾
Western Union Telegraph	79¾	79⅞

GENERAL HARDWARE.

There are no features of special interest in the Hardware market this week; trade is quiet, although a slight improvement is reported over the week previous. The reported failure of the old house of Howell Gano & Co., Cincinnati, has caused a great deal of surprise, and will have the effect of making merchants more careful than ever in the matter of credits. The following circular contains all the information the trade at present have on this subject:

CINCINNATI, March 8, 1878.

The unfortunate condition of business matters, with which you are all familiar, together with the losses sustained during the last few years, renders it impossible for us, notwithstanding the utmost care on our part, to meet our paper as it matures. We are, in consequence, compelled to call a meeting of our creditors, in order to make such an adjustment as on the showing made shall be deemed just and for the best interest of all concerned.

By the 14th inst. we shall be prepared to lay before our creditors a full and detailed statement of our affairs, showing our liabilities and assets. We therefore urge our creditors to be present in person or by representative at our office in this city on the 14th inst. at 11 o'clock a. m., with a view to some satisfactory adjustment and arrangement which will enable us to go on with our business and utilize our assets for the discharge of our liabilities.

We do not desire to make an assignment if the same can be avoided. It is to avoid such needless expense, and in the confident hope that an arrangement satisfactory to our creditors can be made that we urge them to meet us at the time mentioned. Please reply and state if you can or will be present.

Respectfully,
HOWELL GANO & CO

The following paragraph appeared in one of the Philadelphia papers of the 12th instant:

"The condition of Mr. Henry Disston last evening was unchanged, except that he appeared to be conscious of what was occurring around him, but was unable to express himself. The paralytic shock seems to have affected his head, and at times his jaws are locked. He is able to receive stimulants. It is thought that he may linger for a few days at the longest, but that the present shock, which is very severe, will prove fatal. Sheriff Wright and a few others of his relatives passed the night at Mr. Disston's bedside."

The trade, with whom Henry Disston was always popular, will be pleased to learn that a telegram from his son Hamilton, received this afternoon, reports him better, with a possibility of his surviving this attack.

The Nail trade is very quiet this week, the local demand being considerably affected by the unfavorable weather. Prices are unchanged, and we quote the market firm at $2.50 net for 10d. to 60d.

The Wiebusch & Hilger Hardware Company inform us that Messrs. George Wostenholm & Son have advanced their prices on two numbers of Razors, and the list price here has been correspondingly advanced:

Number 01477.....List $7.
" 01478..... " 8.

We understand that the Stanley Works have purchased from Crooke & Co. their entire and well-assorted stock of Wrought Iron Bright Butts. Also, that in addition to the line of Bright, Light, Narrow and Light Inside Blind Butts, heretofore made by them, they have made arrangements to manufacture in the future Bright Butts of sizes and styles similar to those made by Crooke & Co., and will keep on hand a full assortment of the same to supply the wants of the trade. The well-known reputation of the Stanley Works as manufacturers of first-class Butts is a guarantee of the quality of the goods mentioned.

The Turner & Seymour Mfg. Company, Walcottville, Conn., and No. 81 Reade street, New York, have been appointed general agents for Hayden & Co., Middletown, Conn., manufacturers of Blind Trimmings.

The Old Colony Rivet Works, Kingston, Mass., and No. 116 Chambers street, New York, are now prepared to fill orders for Rivets, Hand Iron Cutters, Punches, Shears, Planing and Shaping Machines, Universal Ratchet Drills. Illustrated catalogue of these goods will be mailed on application.

The price of Boxwood and Ivory Rules is somewhat irregular, and although the quotation of discount 60 and 10, and 50 and 10 per cent. respectively, is still nominally the price, these figures do not properly represent the market. Buyers of moderate quantities would have no difficulty in placing their orders at discount 60 and 10 and 10 per cent. for Boxwood and 50 and 10 and 10 per cent. for Ivory.

P. & F. Corbin have just issued a revised and enlarged edition of their illustrated catalogue of Builders' and Miscellaneous Hardware. The book contains, in addition to the large assortment of goods presented in their 1874 catalogue, all the new and improved patterns which have since been added. They invite particular attention to their new styles of Builders' Bronze Hardware, of which they say: "In providing new and artistic patterns we have aimed to secure unity of design and an harmonious arrangement of styles, so as to enable parties in the trade who do not keep these goods in stock to select a complete outfit of such goods as they may require for trimming private dwelling houses or public buildings." The book abounds in illustrations, all of which are first class, and represent the goods as closely as it is possible to do by engravings. As the prices of the goods are omitted in the catalogue, they are supplied to the trade in a separate book which accompanies it.

We invite the attention of the trade to the advertisement of the Providence Tool Co., on page 25, in which they illustrate an Iron Block on which they have expended a great deal of time and labor in perfecting. They are now prepared to fill orders for this Block, which they claim is the most durable, economical, lightest and easiest running Block yet produced; it is not affected by the weather, and all of its parts are open and accessible. The groove or score in the sheave is deep, and prevents the spreading of the rope and its quick wearing out. Henry B. Newhall, No. 11 Warren street, is agent for their goods in this city.

Stewart & Mattson have opened a warehouse at 513 Commerce street, Philadelphia, where they will keep a stock of Hardware and a full line of Remington Agricultural Co.'s goods.

G. B. Walbridge & Co., No. 83 Reade street, have issued the following reduced price list of Lyon's Patent Shears and Punching Presses manufactured by them. This list is subject to discount 20 per cent. to the trade:

Shears for Cutting Round Iron.

No. 0 will cut	¼	inch	and smaller		$6.00
No. 1	5-16,	¼	"	3-16	10.00
No. 2	⅜,	5-16	"	¼	14.00
No. 3	½,	⅜	"	5-16	18.00
No. 4	¾,	½	"	⅜	23.00
No. 5	¼,	⅝	"	½	35.00
No. 6	⅞,	¾,	⅝ and	½	48.00
No. 7	1,	⅞,	¾, ⅝ and	½	60.00
No. 8	1¼,	1,	⅞, ¾, ⅝ and	½	75.00

For Cutting Square Iron.

No. 2 will cut	5-16		and	¼	$16.00
No. 3	⅜,	5-16	"	¼	20.00
No. 4	½,	⅜	"	5-16	25.00
No. 5	¾,	½	"	⅜	38.00
No. 6	¼,	⅝,	½	" ⅜	52.00
No. 7	⅞,	¾,	⅝	" ½	65.00
No. 8	1,	¼,	⅞	" ½	80.00

The above arrangement is regular, but can be altered to suit purchasers.

Shears for Cutting Flat Bar Iron.

No. 0 will cut	¼	x 1-16	Bar	$6.00
No. 1	1¼	x ½	"	9.00
No. 2	1¾	x ¼	"	13.00
No. 3	2 in.	x ¼	"	20.00
No. 4	2 in.	x ⅜	"	30.00

Shears for Cutting Plate Iron.

Any width. Through the center of sheet.

No. 1 will cut	3-16	Plate Iron,	weight	115 lbs.	$32.00
No. 2	¼	"	"	195 "	48.00
No. 3	5-16	"	"	250 "	66.00
No. 4	⅜	"	"	450 "	90.00

Lever works from the front.

No. 5 will cut	7-16	Plate Iron,	weight	650 lbs.	120.00

Lever works from the back.

Punching Presses.

No. 0 will punch ½ hole in ½ iron, 2⅛ in. from edge to center of hole—weight 33 lbs.	$20.00
No 1 will punch 3-16 hole in 3-16 iron, 3⅛ in. from edge to center of hole—weight 65 lbs.	24.00
No. 2 will punch ¼ hole in ¼ iron, 3¼ in. from edge to center of hole—weight 115 lbs.	36.00
No. 3 will punch 5-16 hole in 5-16 iron, 4 in. from edge to center of hole—weight 175 lbs.	48.00
No. 3½ will punch ⅜ hole in 5-16 iron, 4 in. from edge to center of hole—weight 200 lbs.	60.00
No. 4 will punch ⅜ hole in ⅜ iron, 4 in. from edge to center of hole—weight 360 lbs.	80.00
No 5 will punch ½ hole in ½ iron, 7½ in. from edge to center of hole—weight 500 lbs.	105.00

Larger punches made to order.

Patent Combined Hand Punch and Shears, for Round and Flat Iron.

No. 0 will cut 3-16 wire and smaller, and will punch and cut hoop iron	$15.00

This size will be found useful and convenient for light bench work.

No. 2 will cut ⅜ round iron and 1¼ x ¼ bar iron, will punch ¼ inch hole in ¼ iron, 3¼ inches from edge to center of hole; it will be found to be a most convenient machine for general use; weight 200 lbs.	50.00
No. 3 will cut ¾ round iron and 3½ x ⅜ bar iron; will punch ⅜ inch hole in ⅜ iron, 4 inches from edge to center of hole; 420 lbs.	100.00

Stephens & Co., Riverton, Conn., have issued under date of February, 1878, a revised price list of Box Wood and Ivory Rules manufactured by them. A good many new numbers have been added since the publication of their last catalogue. We print below the entire list, which is subject to the ruling trade discounts. Horace Durrie & Co., No. 97 Chambers street, are their agents in this city, and carry a full line of these rules in stock which they offer to the trade at factory prices:

BOXWOOD RULES.

Nos.	Two Feet, Two Fold.	Width in.	Price pr.dz.
1,	Round Joint, 8ths and 16ths of inches	1½	$3.50
2,	Square Joint, 8ths and 16ths of inches and Octagonal Scales	1½	5.00
13,	Arch Joint, 8ths and 16ths of inches, Drafting and Octagonal Scales	1½	8.00
15,	Arch Joint, Extra Thin, 8ths and 16ths of inches, Drafting and Octagonal Scales	1½	10.00
17,	Arch Joint, Bound, 8ths and 16ths of inches, Drafting and Octagonal Scales	1½	16.00
	Board Measure.		
5,	Square Joint, 12ths and 16ths of inch. and Octagonal Scales	1½	8.00
18,	Arch Joint, 12ths and 16th of inches and Octagonal Scales	1½	10.00
22,	Arch Joint, Bound, 12ths and 16ths of inches and Octagonal Scales	1½	18.00
	Slide Rules.		
9,	Square Joint, 8ths, 10ths and 16ths of inches, Drafting and Octagonal Scales, Slide in 12ths and 16ths of inches	1½	9.00
23,	Arch Joint, 8ths, 10ths and 16ths of inches, Drafting and Octagonal Scales, Slide in 12ths and 16ths of inches	1½	11.00
14,	Arch Joint, Gunter's Slide, 8ths, 12ths and 16ths of inches, and 100ths of a foot, Drafting and Octagonal Scales	1½	14.00
16,	Arch Joint, Gunter's Slide, Engineers', 12ths and 16ths of inches, 100ths of a foot, Drafting and Octagonal Scales	1½	18.00
27,	Arch Joint, Bound, Gunter's Slide, 12ths and 16ths of inches, Drafting and Octagonal Scales	1½	24.00
28,	Arch Joint, Bound, Gunter's Slide, Engineers', 12ths and 16ths of inches, and Drafting Scales	1½	28.00
	Two Feet, Four Fold—Narrow.		
41,	Round Joint, Middle Plates, 8ths and 16ths of inches	1	4.00
42,	Square Joint, Middle Plates, 8ths and 16ths of inches	1	5.00
42¼,	Square Joint, Half Bound, 8ths, 12ths and 16ths of in., and Drafting Scales	1	12.00
42½,	Square Joint, Bound, 8ths, 12ths and 16ths of inches, and Drafting Scales	1	15.00
45,	Square Joint, Edge Plates, 8ths, 12ths and 16ths of in., and Drafting Scales	1	7.00
46,	Arch Joint, Middle Plates, 8ths, 12ths and 16ths of in., and Drafting Scales	1	6.00
48,	Arch Joint, Edge Plates, 8ths, 12ths and 16ths of in., and Drafting Scales	1	8.00
49,	Arch Joint, Bound, 8ths, 12ths and 16ths of inches, and Drafting Scales	1	16.00
49¼,	Arch Joint, Half Bound, 8ths, 12ths and 16ths of in., and Drafting Scales	1	13.00
50,	Double Arch Joint, Middle Plates, 8ths, 12ths and 16ths of inches, and Drafting Scales	1	9.00
52,	Double Arch Joint, Bound, 8ths, 12ths and 16ths of in., and Drafting Scales	1	21.00
	Extra Narrow.		
42¾,	Square Joint, Bound, 8ths, 10ths, 12ths and 16ths of inches	¾	14.00
44,	Square Joint, Middle Plates, Thin, 8ths and 16ths of inches	¾	5.50
44½,	Square Joint, Edge Plates, Thin, 8ths and 16ths of inches	¾	8.00
44¾,	Arch Joint, Edge Plates, Thin, 8ths and 16ths of inches	¾	9.00
	Two Feet, Four Fold—Broad.		
53,	Round Joint, Middle Plates, 8ths and 16ths of inches	1⅜	5.00
54,	Square Joint, Middle Plates, 8ths and 16ths of inches, and Drafting Scales	1⅜	7.00
54¼,	Square Joint, Half Bound, 8ths and 16ths of inches, and Drafting and Octagonal Scales	1⅜	15.00
54½,	Square Joint, Bound, 8ths and 16ths of inches, and Drafting and Octagonal Scales	1⅜	18.00
56,	Square Joint, Edge Plates, 8ths and 16ths of inches, and Drafting and Octagonal Scales	1⅜	9.00
57,	Arch Joint, Middle Plates, 8ths, 12ths and 16ths of inches, and Drafting Scales	1⅜	9.00
59,	Arch Joint, Edge Plates, 8ths and 16ths of inches, and Drafting and Octagonal Scales	1⅜	11.00
60,	Arch Joint, Bound, 8ths and 16ths of inches, and Drafting and Octagonal Scales	1⅜	20.00
60¼,	Arch Joint, Half Bound, 8ths and 16ths of inches, and Drafting and Octagonal Scales	1⅜	16.00
61,	Double Arch Joint, Middle Plates, 8ths, 12ths and 16ths of inches, and Drafting Scales	1⅜	12.00
63,	Double Arch Joint, Bound, 8ths, 12ths and 16ths of inches, and Drafting Scales	1⅜	24.00
	Board Measure.		
64,	Square Joint, Edge Plates, 12ths and 16ths of inches, and Octagonal Scales.	1⅜	11.00
65,	Square Joint, Bound, 12ths and 16ths of inches, and Octagonal Scales	1⅜	20.00
66,	Arch Joint, Edge Plates, 12ths and 16ths of inches, and Octagonal Scales.	1⅜	13.00
67,	Arch Joint, Bound, 12ths and 16ths of inches, and Octagonal Scales	1⅜	24.00
	One Foot, Four Fold.		
70,	Round Joint, Middle Plates, 8ths and 16ths of inches	⅝	3.00
71,	Square Joint, Middle Plates, 8ths and 16ths of inches	⅝	3.50
72,	Square Joint, Edge Plates, 8ths and 16ths of inches	⅝	5.00
72¼,	Square Joint, Edge Plates, 8ths, 10ths, 12ths and 16ths of inches	⅞	6.00
72½,	Square Joint, Bound, 8ths and 16ths of inches	⅝	11.00
73,	Arch Joint, Middle Plates, 8ths and 16ths of inches	⅝	4.00
74,	Arch Joint, Edge Plates, 8ths and 16ths of inches	⅝	6.00
75,	Arch Joint, Bound, 8ths and 16ths of inches	⅝	12.00
75⅛,	Arch Joint, Bound, 8ths, 10ths, 12ths and 16ths of inches	⅞	13.00
	Caliper Rules.		
95,	Square Joint, Two Fold, 6 inch, 8ths, 10ths, 12ths and 16ths of inches, and Slide in 32ds	⅞	7.00
96,	Square Joint, Two Fold, 6 inch, Brass Case, 16ths of inches, Slide in 32ds	⅞	8.00
97,	Square Joint, Bound, Two Fold, 6 inch, 8ths, 10ths, 12ths and 16ths of inches, Slide in 32ds	⅞	12.00
98,	Arch Joint, Edge Plates, Four Fold, 12 inch, 8ths, 10ths, 12ths and 16ths of inches, Slide in 32ds	⅞	12.00
99,	Arch Joint, Bound, Four Fold, 12 inch, 8ths, 10ths, 12ths and 16ths of inches, Slide in 32ds	⅞	20.00
100,	Square Joint, Two Fold, 6 inch, 8ths, 10ths, 12ths and 16ths of inches, Slide in 32ds	1⅜	12.00

IVORY RULES.

Nos.	Two Feet, Four Fold.	Width. In.	Price pr.dz.
77,	Square Joint, G. Silver, Edge Plates, 8ths, 10ths, 12ths and 16ths of inches and 100ths of a foot	¾	54.00
78,	Square Joint, G. Silver, Bound, 8ths, 10ths, 12ths and 16ths of inches	¾	72.00
83,	Arch Joint, G. Silver, Edge Plates, 8ths, 12ths and 16ths of inches, and 100ths of a foot, and Drafting Scales	1	64.00
84,	Arch Joint, G. Silver, Bound, 8ths, 12ths and 16ths of inches, and Drafting Scales	1	80.00
86,	Double Arch Joint, G. Silver, Bound, 8ths, 12ths and 16ths of inches, and Drafting Scales	1	92.00
87,	Arch Joint, G. Silver, Bound, 8ths, 12ths and 16ths of in., Draft'g Scales.	1⅜	102.00
88,	Double Arch Joint, G. Silver, Bound, 8ths, 12ths and 16ths of inches, and Drafting Scale	1⅜	116.00
	One Foot, Four Fold.		
89,	Round Joint, Brass, Middle Plates, 8ths and 16ths of inches	½	10.00
90½,	Square Joint, G. Silver, Middle Plates, 8ths and 16ths of inches	½	14.00
91,	Square Joint, G. Silver, Edge Plates, 8ths and 16ths of inches	½	17.00
91½,	Square Joint, G. Silver, Edge Plates, 8ths, 10ths, 12ths and 16ths of inches	⅞	23.00
92,	Square Joint, G. Silver, Bound, 8ths, 10ths, 12ths and 16ths of inches	⅝	28.00
93,	Arch Joint, G. Silver, Edge Plates, 8ths, 10ths, 12ths and 16ths of inches	⅝	21.00
94,	Arch Joint, G. Silver, Bound, 8ths, 10ths, 12ths and 16ths of inches	⅝	32.00
94½,	Arch Joint, G. Silver, Bound, 8ths, 10ths, 12ths and 16ths of inches	⅞	40.00
95½,	Square Joint, G. Silver, Two Fold, 6 inch, 8ths, 10ths, 12ths and 16ths of inches, Slide in 32ds	⅞	$15.00
96½,	Square Joint, G. Silver Case, Two Fold, 6 inch, 10ths of inches, Slide in 32ds	⅞	18.00
97½,	Square Joint, G. Silver, Bound, Two Fold, 6 inch, 8ths, 10ths, 12ths and 16ths of inches, and Slide in 32ds	⅞	30.00
98½,	Arch Joint, G. Silver, Edge Plates, Four Fold, 12 inch, 8ths, 10ths, 12ths and 16ths of inches, Slide in 32ds	⅞	38.00
99½,	Arch Joint, G. Silver, Bound, Four Fold, 12 inch, 8ths, 10ths, 12ths and 16ths of inches, Slide in 32ds	⅝	44.00
99½,	Arch Joint, G. Silver, Bound, Four Fold, 12 inch, 8ths, 10ths, 12ths and 16ths of inches, Slide in 32ds	⅞	48.00
	Six Fold, Two Feet.		
34,	Arch Joint, G. Silver, Edge Plates, Thin, 8ths, 10ths, 12ths and 16ths of inches, and 100ths of a foot	¾	80.00
35,	Arch Joint, G. Silver, Bound, 8ths, 10ths, 12ths and 16ths of inches	¼	90.00
	BOXWOOD RULES.		
	Ship Carpenters' Bevels.		
30,	Single Tongue, 8ths and 16ths of in.	½	$6.00
31,	Double Tongue, 8ths and 16ths of in.	½	6.00
	Three Feet—Four Fold.		
32,	Arch Joint, Middle Plates, 8ths and 16ths inches	1	8.00
	Six Fold, Two Feet, Thin.		
33,	Arch Joint, Edge Plates, 8ths, 10ths, 12ths and 16ths of inches, and 100ths of foot	¼	13.00
	Stephen's Patent Combination Rule.		
36,	Square Joint, Bound (Level, Square, Plumb, &c.)	1⅜	40.00
	MISCELLANEOUS RULES.		
	School Rules, One Foot.		
38,	Maple, Beveled Edge, 16ths of inches	¾	1.00
38½,	Boxwood, Beveled Edge, 8ths and 16ths of inches	¾	2.50
	Yard Sticks.		
110,	Yard Sticks, Maple, Polished		2.00
111,	Yard Sticks, Maple, Brass Tips, Polished		3.50
112,	Yard Sticks, Hickory, Brass Caps, Pol'd.		4.50
	Board, Log and Wood Measures.		
114,	Board Stick, Octagon, Brass Caps, 8 to 23 feet, 2 feet		8.00
115,	Board Stick, Square Brass Caps, 8 to 23 feet, 2 feet		8.00
116,	Board Stick, Octagon, Brass Caps, 8 to 23 feet, 3 feet		12.00
117,	Board Stick, Square, Brass Caps, 8 to 23 feet, 3 feet		12.00
118,	Board Stick, Flat, Hickory, Cast Brass Head and Tip, 6 Lines, 12 to 22 feet, 3 feet		12.00
119,	Board Stick, Flat, Hickory, Steel Head, Brazed, Extra Strong, 6 Lines, 12 to 22 feet, 3 feet		26.00
120,	Walking Cane, Board Measure, Octagon, Hickory, Cast Brass Head and Tip, 8 Lines, 9 to 16 feet, 3 feet		12.00
121,	Walking Cane, Log Measure, Octagon, Hickory, Solid Brass Head and Tip, 3 feet		15.00
122,	Wood Measure, Brass Caps, 8ths of inches, and 10ths of a foot, 4 feet long		8.00
	Bench Rules.		
124,	Bench Rule, Maple, Brass Tip, 2 ft. long		3.00
125,	Bench Rule, Maple, Capped Ends, 8ths and 16ths of inches, 2 feet long		4.00
126,	Bench Rules, Boxwood Bound, 8ths and 16ths of inches, 2 feet long		18.00
	Wantage and Gauging Rods.		
128,	Wantage Rod, 8 Lines		5.00
129,	Wantage Rod, 12 Lines		7.00
130,	Gauging Rod, 120 Gallons, 3 feet		7.00
131,	Gauging Rod, Wantage Tables, 4 feet		18.00
132,	Forwarding Stick, 5 feet		24.00
135,	Pattern Makers' Shrinkage Rule, without Joint, Boxwood, 8ths and 16ths of inches		15.00

The Gunter's and Engineer's Slide Rules are graduated with great care into 8ths, 10ths and 16ths of inches, and are provided with drafting and octagonal scales, and 100ths of a foot.

We use our Patented Joint for these Rules, which we warrant not to grind.

Any Two Fold Rule will be made and graduated for pattern makers' use at an extra cost of $3 per doz., net.

Any Rule on the list will be marked with the Spanish or metric graduation to order without additional cost.

Any style of Boxwood Rule will be made with the inner edges beveled and marked for architects' use, at an extra cost of $2.50 per doz., net. Ivory $6 per doz., net.

Boxes will be labeled with the old Nos. when so ordered.

A. G. Hatry, Pittsburgh, Pa., has associated with himself in the business of Iron Commission and Brokerage and dealers in Iron, Nails, Glass and Railroad Supplies, Porter C. Friend, a gentleman formerly in the Iron business and well known in Pittsburgh and vicinity. In a circular issued under date of 4th inst., announcing this fact, he says: "With our increased facilities we are better enabled to meet the demands of trade, and trust the patronage so liberally bestowed on me in the past by the trade will be continued with the new firm." They have issued under date of 11th inst. the following circular:

114 and 115 Water street,
PITTSBURGH, March 11th, 1878.

Issuing the first circular of the new firm, we would say that prices are still ruling very low, and parties desiring to purchase will do well to stock up: and we quote the market about as follows:

Iron, assorted orders, $1.70.
Nails, " " $2.40 rates for 10d.
Sheet Iron, light gauges, $2.75 rates for No. 24 as a basis.
Plate Iron, ¼, 3-16 and ¼ in. thick, 2⅜¢ per ℔.
Tool Steel, 11½¢ per ℔.
Machinery Steel, 7¢ per ℔.
Tire Steel, 4¢ per ℔.
Window Glass, 70&10 per cent. discount from list.
Borax, ref., in cases, 100 lbs., 9½.
" " in barrels, 300 lbs., 8½.
" " in sacks, 7¾.
Babbit Metal, 7¢ to 50¢ per ℔, according to quality.

Above prices are 60 days, or 2 per cent. off for cash.

We would call the attention of the trade regarding Nails, and the difference between Nails picked by Coyne's patent Automatic Nail Picker and Nails not picked at all, or pretending to be picked by hand sifters or other devices not attached to the Nail machines. The Coyne Picker is the only device attached directly to the Nail machine, and insures the uniformity in size, weight and quality, by testing each Nail as it is made and rejecting all that are imperfect, thus insuring to the consumer from three to five pounds more Nails in each keg, instead of that amount of worthless scrap. Nails cannot be picked wholesale, or by hand or sifters, screens and tumblers. What is worth doing at all is worth doing well. A few sizes, any brand, that is said to be picked, only works to the detriment of the merchant. As all sizes should be clean and picked, and this can only be done by the Coyne machine, the ridiculous attempt to pick Nails by hand or sifters is out of the question and cannot be done.

The trade and consumers know what they get and what they have heretofore gotten, and appreciate a Coyne Machine Picked Nail. In order to secure these advantages, see that the Nails you buy are branded or labeled, "Assorted by Coyne's Patent."

Always ask for Coyne's Machine Picked Nails. Special prices given on application.

Soliciting a share of your patronage, we remain, Yours truly,
HATRY & FRIEND.

We have received from the American Hardware Company, of Melbourne, Australia, a circular which we print below, also the following review of that market, which possesses some points of interest for the trade in this country:

REVIEW OF THE AUSTRALIAN METAL AND HARDWARE MARKET.

OFFICE AMERICAN HARDWARE COMPANY, 9 William street, MELBOURNE, January 26, 1878.

To the Editor of the Iron Age: An exceedingly dull month has been passed in nearly every branch, disappointing the hopes that were entertained, but the continuation of an extraordinarily dry season, affecting the pastoral and agricultural interest, has no doubt largely contributed to the present dullness, and the evil has been intensified by the action of the government, who, for the time being, hold the destinies of the colony in their hands. The Legislative Assembly, in order to force the bill of payment of members through the upper house, tacked it to the bill of appropriations in the supplies for the year. The council, viewing the payment of members as a question of public policy, throws out the bill in consequence of this obnoxious clause. The ministry, unmindful of the business yet to be disposed of, adjourned the Assembly till the 5th of February. The council, not to lose time when important business required attention, adjourned to February 8, and notwithstanding the obstacles the government placed in their way, proceeded to deal with the measures before the House, and adopted an address to the governor on the political situation of the country. In the meantime the ministry are dismissing a large portion of the civil servants, with the view to force the council into submission. The dismissal comprised all the county court judges, judges of Court of Mines and Court of Insolvency, all the chairmen of General Sessions, police magistrates, coroners and three crown prosecutors. That the Supreme Court judges were not dismissed was due to the circumstance that the concurrence of both houses was necessary for their removal. Besides these there were about 100 minor officers in the mining, railway, treasury and other departments dismissed, and a large dismissal is expected in the educational department. This is the position of affairs at present, and the political embroglio has greatly affected business by impairing that confidence in commercial circles which is the life of trade and without which business operations are confined within the narrowest limits. It is to be hoped that an early and satisfactory settlement will be effected between both houses, so that business may be freed from the interruption caused by the disagreement. The metal trade in England by last reports continues in a very languid state, but the colonial trade was excellent. In the export of iron Australia was one of the principal customers. Australia is reported as one of the chief places to which steam engines were shipped. In the above lines we know American productions will rival any English makers. Mr. Higginbotham, chief engineer of Victoria, in his report to his government after a long tour through America, admits that the American locomotives are superior to the English. The best brands of American bar iron, we believe, can be sold here by the side of English brands, as they have a fine reputation among consumers. Cold-rolled Shafting can be sold here also. We advise Pittsburgh, Philadelphia and other Iron manufacturers to look into this matter and give this market a careful consideration, for we believe a well-directed effort at the present time will secure a portion of the Australian Iron trade to the American manufacturers.

Few transactions have transpired during the month in the Hardware and Metal trades. The holidays have intervened, and we are not yet fairly in the swing of business. The reasons before mentioned have checked speculative purchases in many lines.

Galvanized Iron (duty free) is heavy. "Gospel Oak," No. 26, corrugated, 5, 6, 7, 8 and 9, assorted, £25; "Obbs," £24. 10/; Davis' crown brand, £24. 10/.

Fencing Wire (duty free), No. 6, 7, 8 and 9 were £13. 15/, £14. 10/, £15. 5/ and £15. 10/ respectively.

Quicksilver, 25/5 asked; no sales reported.

Blasting Powder continues dull and in favor of buyers.

Bar and Rod Iron find buyers at £9. 10/ to £11. 10/.

Sheet Iron quoted £11 for No. 8 to 18, and £14 @ £15 for 20 to 26.

Plate Iron ranging from £11 to £13.

Hoop Iron is worth £9. 10/ to £10.

Shot brings £42; Sheet Lead, £26.

American Cut Nails—Prices remain nominal at 15/.

French Wire Nails at 18/.

American Hardware is quiet; Collins & Sharp's heavy Axes are quoted at 67/, handled; Collins' heavy Picks quoted 50/; Ames' Shovels moving at 55/; Day's D Handle Shovel, 34 to 36 in., 44/; other brands, 36/.

Hollowware are making at 27½ per cent. from English list.

Cement (English).—Best brands of Portland selling at 15/ to 16/; second quality quoted from 14/ to 15/. Best American brands will compare favorably with English.

American Plaster nominal from 11/ to 12/.

American Chairs.—929 were cleared off at low rates, the market being overstocked. English furniture in the unfinished state is largely imported, and we do not see why American furniture, which is much better in style, could not be sold here if carefully selected for this market.

Kerosene Oil has been neglected. We quote: Devoe's, 15/3½.

Linseed Oil moving steadily at 3/10½ in drums, while bulk brings 3/6.

Slates (American).—No animation; buyers are unwilling to operate until assured of duty being taken off.

Timber and Lumber.—The market is very much depressed, and we advise to stop shipments from the States, as the market is overstocked.

Our English cousins are trying to imitate American goods, and we have noticed in the market hand saws made after Messrs. Henry Disston & Sons' patterns, but they are a poor imitation and will in no way affect his reputation in this market. The English manufacturers find it necessary to imitate our style and finish of goods, otherwise they will lose their colonial trade, as they have lost it in the States and other parts. From the experience we have had in the colonies, we are satisfied a great variety of American manufactured goods can be sold in this market if it is properly presented to the trade, and fair prices can be realized. We are prepared to answer any inquiries in regard to the introduction of American goods into the markets of Australasia, and shall be pleased to open correspondence with manufacturers in the States on this subject.

Wishing you and our friends the compliments of the season, we remain yours, &c.,

AMERICAN HARDWARE CO.
CARL STEPHAN, Pres.

Office of the AMERICAN HARDWARE CO., 9 William st., Melbourne, Australia.

GENTLEMEN: We have the pleasure of announcing that the above company is now fully established in this city, at the above address, and have fine sample and show rooms for the display of American manufactured Hardware, Machinery, Implements, Tools, &c., &c., and by means of resident and traveling agents will canvass thoroughly, in the interests of American manufacturers, every town and city throughout the Australasian colonies.

From our own knowledge, gained by personal experience in the colonies, we are quite satisfied that your goods can be sold here to advantage, and we shall be pleased to act as your general agents for their introduction and sale in Australia.

If you wish to test this market, we recommend you to send us a small consignment of such goods as we may advise, for sale and distribution among the retail trade, and if you will send us a trial shipment we will guarantee to realize satisfactory prices on your behalf, and on arrival will exhibit them in our new show rooms, and request the attendance of the trade by special circular to inspect them. By this means a demand can be created at once for your goods, and the wholesale importers here compelled to carry full lines of them in stock.

This, in our opinion, is the best, cheapest and quickest way to introduce American goods into general consumption in Australia, and we are fully satisfied that a well-directed effort at the present time will result in building up a large and profitable trade on your behalf.

Our shipping agents in New York are Messrs. R. W. Cameron & Co., 23 South William street, and all goods for us consigned to their care will have prompt attention and secure the lowest rates of freight.

We shall be glad if you will furnish us with duplicate copies of the last edition of your illustrated catalogue, with price lists and discount sheets, corrected up to the latest date, and please advise us by each mail of all subsequent changes and alterations.

As this is a most important field for the introduction and sale of your goods, please give the matter your careful consideration, and advise us by the earliest opportunity of your wishes, which shall at all times receive our most careful attention. We are, gentlemen, yours faithfully,

AMERICAN HARDWARE COMPANY.

IRON.

American Pig.—The general tone of the Iron market is gloomy and oppressive; buyers are plenty enough but their views and the views of makers are so wide apart that no business of any magnitude is transacted, and some manufacturers of standard brands say they are practically out of the market until such time as Iron can be sold for at least its cost to produce. We hear of no sales of round lots, although several small parcels which will aggregate about 1000 tons various grades and makes have been taken by consumers during the week. Holders of prime Lehigh Irons are firm in their views at the following figures: Foundry No. 1, $18 @ $19; Foundry No. 2, $17 @ $18; Gray Forge, $16 @ $17.

Scotch Pig.—There is only a small retail demand for Scotch Pig, and prices remain as previously quoted. The sales during the week in lots amount to about 150 tons Eglinton and Coltness. We quote: Glengarnock, $25; Eglinton, $23.50 @ $24; and Coltness, $26 @ $26 50.

Rails.—We hear of sales during the week of between 7000 and 8000 tons Steel Rails at $43, at tidewater. In Iron Rails no transactions are reported. We quote: Steel, $43 @ $44, and Iron, according to quality and terms, $32 @ $37 at mill.

Old Rails.—In the absence of business we quote $19, which is nominally the price here.

Scrap.—We continue to quote No. 1 Wrought, from yard, $22.

We have received the following circulars:

Office of WITHERBEES, SHERMAN & Co., PORT HENRY, Essex County, N. Y., March 11, 1878.

To Consumers of Iron Ore.—GENTLEMEN: Referring to the inclosed circular of the Port Henry Iron Ore Company, appointing us agents for sale of their Ore, and recognizing the continued depression in the business of manufacturing Iron, we have determined upon a still further reduction in the price of Ore for the coming season. We shall offer for sale the product of our Old Bed Mine as well as that of the Port Henry Iron Ore Company's 21 Mine at the following prices, under the name of

"OLD BED 21" ORE.

	Per ton of 2240 lbs.
Selected Lump for puddling	$4.00
Screened Ore for forges	3.50
Furnace Ore	3.00

Deliveries to be made on our wharfs at Port Henry in about equal monthly proportions.

Payments to be made by satisfactory paper at 4 mos., with interest at 7 %; a separate note for each calendar month's delivery to be dated and given on the 15th day of the month following the delivery. If the purchaser shall elect to pay cash for any month's delivery on or before the 15th day of the following month, an abatement of 25¢ ₩ ton will be allowed.

There will be no further reduction in the prices this season, but if the market shall warrant it, another circular, advancing the prices, will be issued.

Office of PORT HENRY IRON ORE Co., 52 Broadway, N. Y., March 11, 1878.

GENTLEMEN: I beg to advise you that the Port Henry Iron Ore Co. have appointed Messrs. Witherbees, Sherman & Co. their agents for the sale of their Ores, formerly known under the market name of "21" Ore, and which will hereafter be designated by the market name of "Old Bed 21" Ore.

Respectfully yours,
J. B. BRINSMADE,
Secretary and Treasurer.

METALS.

Copper.—The market has remained very quiet, and sales for the week have not exceeded 250,000 to 300,000 pounds Lake Superior at 17⅛¢ @ 17¼¢. Baltimore we quote 17⅜¢, nominally. Nothing is transpiring in futures, and they are altogether nominal. London is lower, and wires Best Selected £71. 10/ and Chili Bars £65. By mail we have the following from England dated Feb. 28: "Holders have been asking an advance of from £1 @ £2 ₩ ton, but the market closes with a quieter tone, and last quotations would probably still be practicable, viz.: £70 Tough Ingots; £71 @ £72 Best Selected, and Sheets £76. The stock of fine Copper at Liverpool, Swansea, London and Havre is 31,835 tons, against 30,753 a month since, and 30,676 in January." The increase in February will be observed, and explains the drooping tendency of the market over there. The manufactures of Copper and Yellow Metal are only in moderate request, but prices are sustained at the combination rates. We quote: New Sheathing Copper, 26¢; Braziers, 28¢, and Bolts, 28¢; Yellow Metal Sheathing, 20¢; Yellow Metal Bolts, 25¢, and English Yellow Metal Sheathing, 15½¢ in bond.

Tin.—Although the dealings have been moderate in amount, the market here is quite strong in response to the gradual improvement at London. The steamer Gordon Castle arrived yesterday from Singapore via the Suez Canal, with some 1500 slabs of Tin. Singapore cables $18.75 per picul, an advance of 25¢, with 4/0¼ exchange on London, and the latter quotes Straits Tin £64. 10/, an advance of 10/. Our market closes quiet but fairly firm at the following quotations: Straits, 14⅜¢ @ 14¾¢, gold; English Refined, 14¾¢; Common ditto, 14½¢; and Banca, 17½¢, all gold, large lots. *Tin Plates* have become very dull. We quote, gold, per box, large lines, ordinary brands: Charcoal Bright, $5.87½ @ $6.25; ditto Ternes, $5.75 @ $6; Coke Tin, $5.25 @ $5.50; and ditto Ternes, $5.12½ @ $5.25. They write from Liverpool, under date of 28th ult., as follows: "We are again able to reduce a few of our quotations, and we find other makers willing sellers, though they decline reducing their prices except for positive offers. There is no life whatever in the market, and fair Charcoal Tins are procurable at from 18/3 @ 18/6 for half cross specification. Ternes quoted 7/6 @ 19/. Coke Tins and Ternes procurable at about same as last week."

Lead.—The convention of Lead producers at St. Louis, to which allusion was made in our last report, has, we apprehend, not taken the proper measures for the relief of the Lead interests. The general expectation was that some understanding would be arrived at for the purpose of curtailing production, and that some plan would be adopted to stimulate the export of American Lead. Instead of this the parties there have merely agreed to advance the lowest limit at which they will sell common Lead here, to 4¢. currency, and Lead for corroding to 4.15¢, currency, and their executive committee of seven hope to obtain the concurrence to this measure of all producers over 100 tons. Sales for the week amount to 200 tons Common Domestic at 3¾¢, currency, and we quote the market at the close 3¾¢ @ 3.85¢, currency. Under date Feb. 28th, they write from England as follows: "The demand continues very small, and further concessions are being made without inducing any but small orders. Good Soft Pig could be procured at £18. 7/6; Sheet, £19. 5/; Pipe, £20. 5/, less 3½ per cent. free on board. Spanish, without silver, £18, less 2½ per cent. on quay." Manufactured is in steady, moderate request; we quote Bar, 5½¢; Pipe, 6¢; Sheet, 6½¢, and Tin-lined Lead Pipe, 15¢—all less 10 per cent. to the trade.

Spelter and Zinc.—There is no favorable change yet. A convention of producers is being held at St. Louis to-day, and it is hoped that they will agree to reduce production, which they can easily do. The market here remains as flat as ever, with very little doing. We quote: Domestic, 5⅜¢ @ 5⅝¢, currency, and Foreign, nominally, 5⅞¢ @ 6¢, gold. *Sheet Zinc.*—Sheet is quiet, and prices are weak. We quote: Mosselman, 7¼¢, gold, and Domestic, 6¾¢, currency, nominally.

Nickel.—There is nothing of interest to report; small quantities are selling in the neighborhood of $1.40 @ $1.50, currency, ₩ lb.

Antimony.—The little of Cookson's brand here is readily selling at 13¢, gold; the price for the same in London remains £52.

COAL.

The state of the Coal trade at the present time presents but little encouragement to the operator or dealer. While prices are nominally sustained, and there is even a talk of an advance, there is very little demand, and the Coal afloat, &c., is just enough in amount to demoralize the market. In spite of the stoppages which we have had and the immense restriction of tonnage that has been talked of, we find that the amount of Coal sent to market during the present year is not very much less than the quantity forwarded up to the same date last year. When, however, we consider the greatly reduced consumption this year as compared with last, it becomes evident that the production is proportionately vastly larger than last year. In the face of this fact it is not at all surprising that the prices are not sustained and that the condition of the market is not satisfactory. In order to make the trade at all satisfactory, a very much longer suspension must be had in order to get rid of the Coal now in the market and in stock.

EXPORTS

Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the Week ending March 13, 1878.

	Quan.	Value.
Christinia.		
Ag. imp., pgs	901	$22,723
Stockholm.		
Ag. imp., pkgs	1	6,400
Hamburg.		
Mach'y, cs.	34	5,420
Copper, ckes.	97	21,070
Hdw., cs	116	1,786
Clocks, pkgs.	122	1,915
Tinware, cs.	8	261
Sew. mach, cs.	6	127
Saws	2	100
Lamps, pkgs.	1	99
Cr'ge mtl., pgs	21	818
Belting, bales	3	584
Mf. iron, pkgs	10	580
Stoves, pkgs.	364	720
Wringers, pgs	36	938
Ag. imp., pkgs	60	2,728
Pumps, pkgs.	10	506
Gas bur., case	1	900
Bremen.		
Belting, pkgs.	7	2,500
C'ge mtls., pgs	7	695
Mf. iron, pkgs.	6	143
Hdw., cs.	29	1,234
Ag. imp., pkgs	176	3,951
I. R. goods, cs	1	112
Antwerp.		
I. R. spr'gs, cs	2	185
Ag. imp., pkgs	87	1,100
Liverpool.		
Hdw., cs.	115	6,978
Castings, cs.	4	740
Belting, case.	1	152
Watce ma., cs	1	1,200
Sew. mach., cs	54	5,000
Pit'dware, cs.	2	239
Clocks, cs.	12	970
Ag. imp., pkgs	03	10,909
Belting, bales	2	271
L'mp g'ds, pgs	26	550
Brakes, cs.	85	2,610
Burners, cs.	8	553
Wire g'ds, cs.	3	120
Mach'y, cs.	13	2,320
C'ge mtls., cs.	11	300
H'p iron, bdls.	29	290
Oxi'e zi'c, bbls	250	2,240
Gas bur., case	1	300
London.		
L'p goods, pgs	48	2,171
Rifles, cs.	4	1,500
Pit'd ware, cs.	13	1,112
Oxi'e zi'c, bbls	250	2,240
Refrigerators.	6	100
Hdw., cs.	59	1,121
Clocks, pkgs.	339	4,921
Iron g'ds, bale	1	217
Mach'y, cs.	31	1,190
Gas fixt., cs.	6	469
Ag. imp., pkgs	99	2,955
Sew. mach., cs	83	6,433
Clocks, cs.	9	189
Hdw., cs.	6	143
Glasgow.		
Springs, bxs.	23	175
Sew. mach., cs	1	187
Mach'y., cs.	1	76
Pump	1	60
Ag. imp., pkgs	6	120
Hdw., cs.	5	315
Belting, bale.	1	1,092
British North American Colonies.		
Mf. iron, pkgs.	50	97
British West Indies.		
Mf. iron, pkgs	21	155
Nails, kegs.	31	106
Hdw., cs.	16	194
British Possessions in Africa.		
Hdw., cs.	18	140
C'ge mtls., pgs	21	2,500
Rifles, case	1	$100
Mf. iron, pkgs.	59	350
Mach'y., cs.	6	75
Havre.		
Ag. imp., pgs	3,719	122,553
Hdw., cs.	40	941
Guns, cs.	1	70
R. R. ties.	10,009	5,000
Mach'y, cs.	4	800
Cutlery, cs.	2	288
Marseilles.		
Cr'ge ma., pgs	110	340
Ag. imp., pkgs	423	9,850
French West Indies.		
I. C. freezers.	72	189
Clocks, cs.	3	185
Sew. mach., cs	13	320
C'ge mtl., pgs.	4	400
Tinware, cs.	7	110
Cuba.		
Ag. imp., pkgs	27	693
Nails, kegs	474	1,204
Lamps, pkgs.	3	121
R. R. ir'n, t'ns	28	1,000
Tin, bxs.	12	108
Mf. iron, pkgs.	11	180
Mach'y, cs.	82	2,580
Hdw., cs.	43	1,673
I. R. g'ds, bale	1	36
Brasil.		
Clocks, pkgs.	51	870
Mach'y, pkgs.	6	354
Hdw., cs.	37	570
Irons, cs.	60	374
Wire, cks.	2	80
Cages, cas	1	190
Mf. iron, pkgs.	427	937
Ptg. mtls, pgs.	7	68
Pumps, pkgs.	2	150
Ag. imp., pkgs	91	1,933
Tacks, cs.	31	990
United States of Colombia.		
Iron goods, cs	3	290
Cartridges, cs.	13	399
R. R. mtls, cs.	1	52
Nails, kegs	48	143
Ag. imp., pkgs	6	94
Carbines, cs.	2	598
Hdw., pkgs.	76	1,893
Sew. mach. cs.	34	949
Mf. iron, pkgs.	21	905
Revolvers, cs.	2	606
Iron bars.	60	399
Cars	10	4,522
Nails, bxs.	4	47
Guns, bxs	3	750
Cutlery, pkgs.	39	2,003
Mach'y., pkgs	44	2,190
La'p g'ds, pgs	5	211
Clocks, bxs.	8	138
Tacks, cs.	3	47
Venezuela.		
Hdw., pkgs.	54	667
Cutlery, cs.	3	254
Sew. mach., cs	152	3,448
Nails, bxs	9	108
Mf. iron, pkgs	18	169
Iron goods, cs.	1	50
Ag. imp., pkgs	2	44
Tinware, cs.	15	300
Cisplatine Republic.		
Ag. imp., pkgs	342	3,902
Tinware, cs.	6	85
Sandpaper, cs	5	313
Hdw., pkgs.	13	585
Pumps, cs.	2	190
Tacks, cs.	18	195
Lamps, pkgs.	5	230
Arms, cs	3	275
Revolvers, cs.	1	26
Clocks, cs.	49	480
Irons, pkgs.	12	180

IMPORTS

Of Hardware, Iron, Steel and Metals into the Port of New York, for the Week ending March 12, 1878:

Hardware.

Boker Hermann & Co.
Files, cks., 3
Berbecker J. & Co.
Cases, 11
McCoy & Co.
Chains, cks., 10
Casks, 3
Cases, 9
Moores J. P. Sons,
Cartridge cases and wads, cs., 4
Guns, cs., 3
Rice, Lewis & Co.
Wire rope, coils, 5
Spies, Kissam & Co.
Guns, cs., 4
Ward Asline,
Mdse., pkgs., 6
Wiebusch & Hilger Hdw. Co.
Cutlery and hardware, pkgs., 24
Order,
Cartridges, cs., 4
Files, cks., 20
Anvils, 85

Iron.

Naylor & Co.
Spiegel, tons, 538
Perkins, Livingston & Post,
Cast, tons, 104
Order,
Bars, 473
Sheet, bdls., 69

Steel.

Brown William,
Bundles, 139
Cases, 14
Carey & Moen,
Steel wire, bdls., 92
Naylor & Co.
Scrap, spring, tons, 74
Prosser Thomas & Son,
Forgings and steel, pkgs., 16
Robbins C. & Son,
Bundles, 90
Bars, 4
Wilson & James,
Sheet steel, cks., 6
Woodford W. O.
Cases, 11
Bars, 17
Bundles, 180
Order,
Scrap spring, tons, 16½
Bundles, 254
Bars, 13
Packages, 39
Casks, 10
Cases, 1

Metals.

Abell C. C. & Co.
Metal, bales, 8
Brown Bros.
Tin, slabs, 577
Byrne Jos. & Co.
Tin plates, bxs., 3405
Bruce & Cook,
Tin plates, bxs., 750
Coe & Co.
Scrap metal, bbls., 213
Cort N. L. & Co.
Tin plates, bxs., 2140
Naylor & Co.
Tin plates, bxs., 1499
Pratt Charles & Co.
Tin plates, bxs., 517
Phelps, Dodge & Co.
Antimony, cks., 25
Tin plates, bxs., 1863
Scheider Joseph & Co.
Tin plates, bxs., 311
Thackray & Co.
Scrap brass, bbls., 1
Windmuller L. & Roelker
Zinc, cks., 15
Wheeler E. S. & Co.
Tin plates, bxs., 300
Order,
Tin plates bxs., 2942
Tin, slabs, 5186
Antimony, cks., 50
Tin and terne plates and taggers, bxs., 2536
Tin, ingots, 600
Tin, bbls., 21

OLD METALS, PAPER STOCK, ETC.

Business in this market still continues unimproved, and prices remain nominally unchanged. Old Metals are very dull. Dealers are accumulating stocks without much prospect of soon selling them, unless at figures far below the market prices. Nearly all grades of Rags and Paper Stock have been slow of movement, and quotations have not changed materially.

The purchasing prices offered by dealers for Old Metals are as follows:

Copper, heavy	per lb.	$0.13	@ ..
Copper Bottoms	"	.11	@ ....
Yellow Metal	"	.10	@ ....
Brass, heavy	"	.09½	@ ....
Brass light	"	.08	@ ....
Composition, heavy	"	.11½	@ ....
Lead, solid	"	.02½	@ ....
Tea Lead	"	.02½	@ ....
Zinc	"	.03	@ ....
Pewter, No. 1	"	.09	@ ....
Pewter, No. 2	"	.07	@ ....
Wrought Iron	per ton.	17.00	@ ....
Light do	"	11.00	@ ....
Stove Plate	"	9.50	@ ....
Machinery do	"	12.00	@ ....
Grate Bars	"	5.00	@ ....

The prices current for Rags, &c., are as follows:

Canvas, Linen	per lb.	3 c.	@ 3½c.
" Cotton, No. 1	"	5½c.	@ ....
" No. 2	"	2½c.	@ ...
White, No. 1	"	4¾c.	@ ....
" No. 2	"	2¾c.	@ ....
Seconds	"	2 c.	@ .. .
Mixed, Woolen	"	2 c.	@ 3 c.
Soft, do	"	5½c.	@ 6 c.
Gunny bagging	"	3 c.	@ ....
Jute butts	"	2¼c	@ .. .
Kentucky bagging	"	3 c.	@ ....
Book Stock	"	2½c.	@ ....
Newspaper Stock	"	2 c.	@ 2¼c.
Waste Paper and Scraps	"	1½c.	@ ....
Kentucky Bale Rope	"	4 c.	@ ....
Oakum Junk, No. 1	"	4½c.	@ 5 c.
" No. 2	"	3 c.	@ ...
Tarred Shaking	"	1 c.	@ 1½c.
Grass Rope	"	....	@ 3¼c.

PHILADELPHIA.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, March 12, 1878.

Pig Iron.—The condition of the market continues much the same as on date of our last report. Prices are steady, with a tendency toward higher rather than lower figures, although the average sales would probably show very little change from the previous week. Transactions during the past few days have been on a somewhat exceptionally large scale. In three lots over 12,000 tons were placed, and a lot of 2500 tons now under negotiation will probably be closed in course of a day or two. These, however, are special cases, the larger portion being to cover contracts made by pipe founders, Messrs. McNeals & Archer having closed a contract for 3000 tons for Lewistown, Maine, and the Warren Foundry a similar quantity for Boston. Messrs. Mellert & Co., of Reading, have also a contract with the city of Philadelphia for cast-iron pipe. Some of the foundries in the city are fairly employed, but the demand for manufactured Iron shows no improvement and the immediate outlook is not specially encouraging. There seems to be more confidence in prices, however, and although there is no speculative feeling, the closest buyers and the least sanguine men in the trade have no expectation of lower prices. The Lehigh companies are said to have been advised of a further advance in coal to take effect next month, so that they are indifferent about business unless at full prices. Buyers cannot be influenced to exceed their wants, however, so that the sales from week to week fairly indicate the actual condition of business. From the fact that current production is absorbed from week to week and the cost of production of Pig Metal gradually increasing, a slight advance in prices ought to be obtained; but for the time being there seems to be no one bold enough to take the initiative, although if coal is further advanced, as intimated it will be, an advance in Iron must follow or many furnaces go out of blast. Sales during the week have been as follows: No. 1 Foundry, $18.50 @ $19; No. 2 do., $17 @ $17.50; Gray Forge, $16.50 @ $18; Mottled, $15.50 @ $16, and about 5000 tons of Bessemer on private terms. Market quiet and steady.

Blooms.—The market shows no improvement, and prices are almost nominal, as follows: Sunken Scrap Blooms (2464 lb), $42 @ $45; Northern Ore Blooms (2240 lb), $37 @ $39; best quality Charcoal Billets (2240 lb) for wire and steel purposes, $50 @ $55; Bars, do., $65 @ $67.50; Sheet Iron Blooms, cornered (2464 lb), $60 @ $62.50; Cold-blast Charcoal Plate Blooms, $55 @ $57.50; run-out Anthracite, $50 @ $52.50.

Muck Bar.—The market continues dull and sales are usually in small lots at about the following quotations: Soapstone, $30; Boiled on Ore, $33; extra quality for Hoops and Rods, $35, all Philadelphia delivery.

Plate and Tank Iron.—We cannot report any improvement in the demand, and prices in consequence are irregular and weak. None of the mills have any important orders on hand; several in this vicinity are doing scarcely anything, while others are running on small orders received from day to day. The outlook is not specially encouraging, although there is an expectation in some quarters of an early renewal in the demand. We quote: Common Plates, 2.3¢ @ 2.4¢; Tank Iron, 2.3¢ @ 2.5¢; C. No. 1, 2.4¢ @ 2.6¢; Shell Iron, 2.75¢ @ 2.9¢; Flange Iron, 3.75¢ @ 4¢; Solid Fire Box, 4.85¢ @ 5¢, and Best Bloom, 5.5¢ @ 6¢.

Sheet Iron.—The demand for Sheets keeps up fairly, and there is a full average business doing considering the season. Prices are low, however, and manufacturers complain that there is no profit whatever at the rates now current, but it is impossible to obtain any advance in the present condition of the market. We quote jobbing lots: Refined Sheet Iron, No. 26 to 28, 3.6¢ @ 3.7¢; No. 22 to 24, 3.4¢ @ 3.5¢; No. 16 to 21, 3.2¢; Best Bloom Sheets, No. 26 to 28, 5.4¢ @ 5.5¢; No. 22 to 24, 5.2¢; No. 16 to 21, 4.9¢ @ 5¢; Common Red Plates, 5-16 to 18, 2.4¢ @ 2.5¢; Refined Plates or Blue Annealed, 5-16 to 18, 2.6¢ @ 2.7¢; American, R. G., 5 16 to 18, 3.2¢ @ 3.3¢; Best Bloom, 5-16 to 18, 4.9¢ @ 5¢; Philadelphia Russia, 7¢ @ 7.5¢; A. Patent Planished, 10½¢.; B. Patent Planished, 9½¢; Bloom Galvanized, 40%; Refined Galvanized, 50%.

Bar Iron.—There is no special change to note; as a rule the market is dull and quiet, with exceptional cases in which some improvement is reported. There is a more active demand for first-class Iron, and makers of such are fairly supplied with orders and are firm in their prices. Lower grades of Iron are not so saleable as they were some time ago, and there are a good many complaints of the market being flooded with low-priced Iron from a distance. There is a moderate consumption going on, and it is quite likely that there is a fair average demand, but with a little more competition from outside parties it is difficult to maintain prices, except for the best known and favorite brands. We quote the market steady at 2¢ for best Refined Iron, with other descriptions down to 1.6¢.

Skelp Iron.—We do not hear of any new business, but two or three of the mills are fairly employed on orders received some days ago. Prices are irregular, and although 2¢ @ 2.2¢ is the nominal quotation, orders have been placed at something below the inside figure.

Steel Rails.—The market for the past few days has been somewhat irregular, and it is reported that orders have been placed at concessions from prices recently ruling. This is denied at the mills, and they claim to have declined offers for large lots at $41, and to have entered others at $41.50 @ $42, at mills. There appears to be some sharp competition going on, however, and it is not unlikely that concessions have been made in special cases, which is causing an uneasy feeling in the trade and may lead to still lower prices. There is no immediate scarcity of business, and no reason to expect there will be, as the mills are said to have an average of three to four months' work on hand already, with inquiries which seem to indicate considerable business additional in course of the next few weeks. We have no actual sales to report; sellers claim to be firm at quotations, while buyers claim to have placed their orders at 50¢ @ $1 less. In the meantime we quote the market unsettled at $41.50 @ $42.50, cash, at mills in Eastern Pennsylvania, and about $43 @ $44 at mills in Western Pennsylvania.

Iron Rails.—There has been a little more activity during the week, and in addition to sales of numerous small lots we hear of two 500-ton transactions, and nearly 1000 tons of streets. Prices have been very low, however, and the condition of the trade shows no evidence of improvement, but rather the reverse, as shown by prices realized in late transactions. We quote, $32 @ $35, at mills, according to quality and terms of settlement, with sales at about medium figures.

Old Rails.—There is no improvement in the demand, and no sales have been made for some time past, except in lots of 100 or 200 tons each, and these at a reduction of fully 50¢ per ton from previous transactions. Offerings are liberal at $20.50, but buyers appear to make $20, four months, as their extreme figure, at which several sales of small lots are reported. We quote: $19.50 @ $20.50; market exceedingly dull.

Old Car Wheels.—There is a demand for Wheels, but we cannot learn of any offering on the spot. Sales are reported of a lot at $17.50, delivered at an outside point. We quote $17.50 @ $18, Philadelphia delivery.

Old Car Axles.—No sales reported. We quote, $25 @ $26, nominal. We note sales of about 50 tons Hammered Shafting at $28.

Scrap Iron.—There is a little more demand, and sales of selected Wrought are reported at about $23. Cast is in demand at about $15 @ $16. We quote: Wrought, $22 @ $23; Cast, $15 @ $16.

Nails.—Prices are steady at $2.60, with the usual rebate to buyers of large lots. The demand is not active, but stocks are light, and the trade is believed to be in a healthy condition.

Lead.—Domestic is quiet but firm at about 3¾¢, at some slight advance on prices recently current. Manufactured is steady. We quote: Bar, 5½¢; Pipe, 6¢; Sheet, 6½¢. Shot is fairly active and firm, as follows: Chilled, 9¢ @ 10¢; Drop, 7½¢ @ 8½¢; Buck, 8½¢ @ 9½¢, all less the regular trade discount of 10 %.

PITTSBURGH.

Office of *The Iron Age*, 77 Fourth Avenue, } PITTSBURGH, March 12, 1878. }

The weather has been clear and pleasant during the past week, bringing vegetation forward rapidly, and general business, while backward for the season, has commenced to brighten up. The country roads, under the influence of the sun and wind combined, have dried up and are getting into condition, rendering it possible again to transport goods into the interior; and the demand for all kinds of manufactured goods will no doubt improve rapidly within the next few weeks, as stocks in hands of both jobbers and consumers are comparatively light. The outlook is favorable, in some respects, for a good spring trade, but in others it is not so encouraging. The numerous failures recently have impaired confidence badly, and as a result business is very much restricted. Both our merchants and manufacturers could increase their sales largely if they were willing to sell on time, but this they are refusing to do. Only those who are known to be able and prompt in remitting can buy on time, as goods of any kind are considered better property than doubtful book accounts. Bankruptcies have become very common hereabouts of late. Scarcely a day passes but one or more is announced, and the feeling begins to obtain that the bankrupt law is being badly abused and should be repealed.

The feeling in regard to the pending tariff bill in its modified form has undergone a change, and some of our manufacturers, while not favorably impressed with the movement, believe that the best thing to be done is to have it passed. The reason assigned for this is that if it is not passed this session it will be brought before the next Congress again, thereby renewing the agitation through which we are now passing, whereas if it is put through this session it is contended that it will not be brought forward again for years. Moreover, it is claimed that the bill has been shorn of its most objectionable features to the tariff interest, and, therefore, if passed can do no particular harm, while at the same time it will put the free traders in a position that will prevent them doing anything for some time to come and thereby prevent a renewal of the agitation.

Pig Iron.—There has been rather more business the past week but no improvement in prices, which are more unsatisfactory to the producing interest now than at any time since the panic. While there is no "let up" in complaints on the part of the mills, there is good reason to believe that they are in better condition than they were a year ago, while with furnacemen the very reverse is the case; the former, owing to limitation of production, have been able to maintain prices; while the latter, owing to a light consumption and urgent wants of some of their number, who were forced to realize at the best figures obtainable, have been obliged to make a sharp reduction during the time in question, say, $2 @ $3 per ton. The production continues light: a small proportion of the furnaces in the West are in blast, and but for the fact that many of them are ready to blow in upon short notice, thereby increasing the production, a better and more hopeful feeling would prevail. While it appears to be generally conceded that prices cannot possibly go much, if any, lower, there is not likely, in view of what has been stated, to be any immediate advance; hence buyers, unless they get hold of some one whose necessities makes it imperative to sell at the best figures to be obtained, are buying only as immediate wants require. Eastern Coke Irons continue to supplant to a considerable extent Western Bituminous Coal Smelted, because of their being so much cheaper. The mills are buying just as little of the latter as they can possibly help, although they are compelled to buy some to bring up the quality of the former. Foundry Irons are also dull, unusually so, and prices continue to rule in buyers' favor. We quote prices as follows:

BITUMINOUS COAL SMELTED—(LAKE SUPERIOR ORE).			
No. 1 Foundry	4 mos.	$20.00 @	$21.00
No. 2 Foundry	"	19.00 @	20.00
Mill Red Short	"	19.00 @	19.50
Mill Neutral	"	18.00 @	18.50
Mill, White, Mottled Red Shot	"	17.50 @	18.00
Mill, White Neutral	"	16.00 @	17.00
EASTERN COKE.			
No. 1 Foundry	4 mos.	$20.00 @	$21.00
Gray Forge	"	17.00 @	17.50
ANTHRACITE.			
No. 1 Foundry	4 mos.	$21.50 @	$22.00
No. 2 Foundry	"	20.00 @	20.50
Mill, Red Short—"Cornwall" Red Short	cash	20 50 @	....
Mill, Neutral	4 mos.	18.00 @	....
HANGING ROCK CHARCOAL.			
No. 1 Foundry	4 mos.	$24.00 @	$27.00
No. 2 Foundry	"	23.00 @	26.00
No. 3 Foundry or Mill	"	22.00 @	22.50
Cold Blast—"Vesuvius" and "Hecla"	"	35.00 @	38.00
Eastern Cold Blast	"	30.00 @	....

Manufactured Iron.—While business is dull in the general Iron business—unusually so for this season of the year—it is in a more healthy condition than it was at this time last year, and the outlook is considered favorable in more respects than one. The limitation of production in the West has been productive of much good, and there is reason to believe that it is being pretty faithfully and generally adhered to, the intimation of your Cleveland correspondent to the contrary notwithstanding. Stocks in the West and South are known to be comparatively light, and with a few weeks good weather, of which we are now having a foretaste, and good roads, a largely increased business is almost assured. As yet but few if any of the mills are pressed with orders, but we are inclined to the belief that within a very few weeks they will have all they can do working single turn. Bars may be quoted at 1.70¢ @ 1.75¢, 60 days; Hoop Iron, 2.50¢ @ 2.75¢ rates; Sheet, 2.80¢ @ 2.90¢; Tank, 2.50¢ @ 2.75¢.

Nails.—Trade continues backward, although it is improving slowly, and the indications are still considered favorable for a good spring trade. While orders are not coming forward as freely as usual at this season of the year, some large shipments of stock have been made both from here and Wheeling by river within the past two or three weeks, those of our manufacturers having branch agencies being anxious to take advantage of the present cheap river freights. Shipments are being made to St. Louis, a distance of 1200 miles, at 10¢ @ 12½¢ ₱ keg, and to all points accessible by river at proportionately low rates. No change in prices; less than 200 kegs, $2.50, 60 days; 200 kegs and upward, $2.40, 60 days, with 2 % off for cash. The regular monthly meeting of the Western Association takes place to-morrow and if anything of importance is transacted it will be duly forwarded to *The Iron Age* by telegraph.

Steel.—There is a continued good demand for all the leading grades and styles of Steel, and some manufacturers report that, although working up to their full capacity, they are unable to keep up with their orders. Prices unchanged. Tool Steel, 11¢ @ 13¢; Machinery do., 5¢ @ 7¢; Spring do., 6¢ @ 7¢—mostly 6¢ @ 6½¢; Plow, 5¢ @ 8¢; Tire, 4½¢ @ 5½¢; Boiler Plate, 7¢ @ 8¢. The demand for Boiler Plate has grown wonderfully within the past year or two, and on Western steamboats Steel boilers have almost entirely supplanted those of Iron, owing to the fact that there is so little difference in the cost, in addition to which they are so much more durable and safer.

Wrought Iron Pipe.—The market for all kinds of Wrought Iron Pipe continues light, as it usually is this month, but there is every indication of a good spring and summer trade. Business is always dull during the winter season, when outdoor work has to be suspended, particularly in the oil producing region, consequently there is but little inquiry for either Oil Tubing or Casing. No change in discounts, which may be quoted at 55 @ 60 % off regular list.

Scrap.—The movement in all kinds of Scrap continues light and prices without quotable change. Old Iron Rails easier, and it is expected that prices will rule lower. We continue to quote at $20 @ $21, cash, according to quality; Old Car Wheels, $19 @ 20; No. 1 Railroad Wrought Scrap, $22 @ $23; Boiler do., $24 @ $25; Blacksmith do., $20 @ $21; Wrought Turnings, $16 @ $17; Cast Turnings, $11 @ $11.50; Car Springs, $38 @ $39; Car Axles, $28 @ $29.

Window Glass—The demand continues light, as it always is in March, but the complaint on the part of manufacturers is more in regard to prices than anything else; within the past week or two our manufacturers, in order to meet competition in the West, have been forced to increase discounts, and we now hear of sales of car load lots at 70, 10 and 10, and in some instances 70, two tens and five on top of that again. In a jobbing way 70 off.

Coke.—There is a continued fair degree of activity, but, like the pig iron trade, there is no margin for profit, and it is not strange, therefore, that there have been failures in the Coke trade as in other branches.

Coal.—Shipments are still being made to the down-river markets, dealers being anxious to take advantage of the water; notwithstanding those markets are all overstocked, and prices are down very low, no additional failures since date of last report, but it is feared there will be. According to an arrangement made some time ago, the mines are only being operated half time; in other words, the miners work two weeks and then play two weeks. This arrangement holds until the 1st of April.

CHATTANOOGA.

Office of *The Iron Age*, Market and 8th Sts., } CHATTANOOGA, March 12, 1878. }

Business in all lines during the past week has been about as dull as possible. The low price of corn induces farmers to hold it back from market as long as possible, and this has largely contributed to curtail business, which is apt to be quite lively at this season. Then the season being neither winter nor spring, in a mercantile sense no distinctive line of operations is possible with any class, unless it may be with those who sell plows and the like. This line of machinery is in great abundance here this season, and those who handle the trade seem to be doing a fair business. The weather during the week has been warm, dry, sunny and May-like. Farmers are active in preparations for getting their corn, oats, &c., into the ground, which is in excellent condition.

Pig Iron.—Dullness has marked the trade for the week in Forge Irons, and prices tend to weaken. Foundry Irons maintain former quotations, with demand fully up to the ability of the furnaces to supply. We quote: Coke Irons, No. 1 Foundry, $20 @ $21; do., $18 @ $19; No. 2, $16 @ $17; Gray Forge, $13 @ $14; White and Mottled, $11 @ $12. Hot Blast Charcoal—No. 1 Foundry, extra, $20 @ $21; do., $19 @ $20; No. 2 Foundry, $17 @ $18; Gray Forge, $16 @ $17; White and Mottled, $15. Cold Blast Charcoal—Car Wheel Metal, $22.50 @ $27.50; do., Extra Standard, $24.50 @ $29.50; Forge, $17.50 @ $20.

Miscellaneous.—Muck Bar has declined. We quote it at $27 @ $31. Old Rails are scarce and $1 higher. We quote them at $17.50 @ $18.50. Old Car Wheels, $18.50 ₱ ton, and in fair supply.

Ores.—Brown Hematite, 50 to 56 %, ; ₱ ton, $1.75 @ $2.25. Red Fossiliferous, 50 to 56 %; ₱ ton, $1.70 @ $1.90. The above prices for Ores delivered in Chattanooga on cars or on the wharf from flat boats.

Nails.—Demand for Nails holds up, and the mills find difficulty in meeting orders, but there is no improvement in prices. We quote at $2.50, with usual discounts on large lots.

Manufactured Iron.—Bar Iron continues in comparatively light request. Mills are still running full and are several weeks behind their orders. Bar we quote at $2. The demand for Bolts and Spikes continues good. We quote: Railroad Spikes, $2.50; Light Rail, $2.25; Track Bolts, $3; Trestle Bolts, $4.

Iron Rails.—The mill here is clearing up what few small orders are on hand preparatory to changing the product to steel. Business light. Rails at the mill, $35 @ $36 per ton.

Coke.—The only interest in the market is the prospect of securing a superior article. Reference to our news columns will show that this demand is to be fully met by manufacturers. We quote at $2.50 per ton on cars in Chattanooga.

Coal.—We hear of transactions in some lots of strictly lump steam Coals for locomotive use at 8¢ per bushel, delivered. We quote run of mine to manufacturers at $2.50 per ton, on cars in Chattanooga.

CLEVELAND.

CLEVELAND, March 12, 1878.

Iron Ore.—Sales of Ore continue to be made with the usual regularity, and the aggregate is larger than ordinarily at this season of the year. The early opening of navigation happens fortunately for Ore buyers, as many had allowed their stocks to run low. If these had been forced to buy supplies from stocks in store here, there would naturally have been a firmer feeling and possibly a slight advance in price. This early opening has taken away the last chance for a firmness among the Ore companies. Some of the vessel owners are willing to commence carrying upon their season contracts; but the Ore companies demur. It is the policy of the latter to keep the new ores back as long as possible. Prices for season delivery are about as quoted last week, with only a fair amount of business doing.

Pig Iron.—The usual spring trade may be said to be fairly open, but with less than usual activity. Sales of Foundry Irons are being made at prices heretofore unknown in this market. The quality of the low-priced Irons, however, is poor. Additional financial embarrassments are reported from the new Shawnee country, and the supply of poor, cheap Irons coming from that locality appears to be short lived. Charcoal Pig Iron is less active than a week ago.

Bar Iron and Nails.—Trade in the manufactured article continues active, but with very severe competition. The producing capacity is still beyond the demand for consumption. Prices vary, according to the conditions governing individual cases.

Scrap.—All kinds of Scrap are in better demand than a week since. The market is firm.

BOSTON.

MARCH 9.—*Pig* continues very dull. We quote: $20.50 @ $21 for No. 1; $19 @ $19.50 for No. 2, and $18.50 @ $19.25 for Gray Forge. Scotch Pig is dull, with a very light demand. *Bar* continues unchanged, quoting $43 @ $45 for Refined and $35 @ $36 for Common. American Rails, $32 @ $37. Steel Rails, $43 @ $44, from mill. Nails are in light demand at unchanged prices. Sheet is selling at 3¢ @ 3¼¢ ₱ lb. Russia is quiet at 10¼¢ @11¢. We quote English Spring Steel at 7¢ @ 8¢, gold; 9¢ @ 11¢ for German; 9¢ @ 11¢ for Machinery; 14¢ @ 15¢ for Cast; 10¢ @ 12¢ for Blister; 8¢ for American Spring; 13½¢ @ 14¢ for Cast; 9¢ for Blister; and 8¢ for Machinery. There have been sales of 10,000 tons Steel Rails, to be delivered at the mills. *Copper* is dull and easy, with small sales at 17½¢ @ 17¼¢. For manufacturers we quote New Sheathing, 28¢; Bolts and Braziers, 30¢; Yellow Metal Bolts, 25¢ @ 25½¢; ditto Sheathing, 20¢. *Lead* continues easy. We quote: Pig, 3¾¢ @ 4¢, currency; Sheet, 6½¢; Pipe, 6¢; Tin-Lined Pipe, 15¢; Bar Lead, 5½¢; all of these, excepting Pig, are subject to the usual trade or 10 % discount. *Antimony* is strong at 12¾¢ @ 13¢, gold, for Boston spot lots, and *Spelter* is easy, closing at $5.50 on the spot for 10-ton lots. *Tin* is dull, with a very light demand. We quote: Straits, 14¾¢ @ 15¢; Banca, 17½¢ @ 17¾¢; Refined English, 15¢ @ 15½¢, gold. We quote Plates: Charcoal, I. C., $6.25 @ $6.50; Coke, $5.50 @ $5.75; and Terne, $5.90 @ $6.20, gold.—*Commercial Bulletin.*

CHICAGO.

L. R. HULL & Co., 95 Washington street, under date of March 11, report as follows: There has been little or no change in this market. Trade is affected somewhat by prospect of cheap freights owing to a possible early opening of lake navigation. We quote:

LAKE SUPERIOR CHARCOAL		
Lake Superior No. 1		$23.00 @ 24.00
" No. 2		22.00 @ 23.00
" No. 3		22.00 @ 23.00
" No. 4 and 5		22.00 @ 23.00
AMERICAN SCOTCH.		
Mahoning Valley, No. 1		22.50 @ ....
" No. 2		21.50 @ ....
Shawnee, No. 1		22.00 @ ....
" No. 2		21.00 @ ....
Jackson County, Ohio, No. 1		22.00 @ ....
" No. 2		21.00 @ ....
Silvery Gray		20.00 @ ....

ST. LOUIS.

Specially reported by Messrs. SPOONER & COLLINS, Iron Commission Merchants, 217 North Third street, St. Louis, under date of March 7: Our market has been dull, and nothing doing. We anticipate an improvement in the demand for Pig Iron as soon as the present bad weather lets up. We quote same as last:

	No. 1.	No. 2.	Mill.	White and M't'l	
M'souri Stone Coal	.....	.....	.....	.....	
Missouri Charcoal	$20.00	$18.50	$18.00	$17.50	
Tenn. Charcoal	22.50	20.50	18.50	17.00	
				Mottled.	White
South. Coke, soft and strong	23.00	21.00	19.00	18.00	$18.00
Hang. Rock Charcoal	25.00	24.00	23.00	.....	
Hang. Rock Charcoal, Cold-short.	23.00	.....	.....	.....	
	Extra No. 1 I. M. Ore.	No. 1 I. M. Ore.	Extra A No. 1 Native.	No. 1. Native.	Alice, Am. Scotch
Hang. Rock Coke, equal to Scotch.	25.00	24.00	24.50	23.50	25.00
	Extra No. 1.	No. 1.	B No. 1.	No. 2.	
West Va. Coke	23.50	23.00	22.00	21.50	

COLD-BLAST CHARCOAL—All Numbers.		
Hanging Rock	4 mos.	$25.00 @ 38.00
Tennessee	4 mos.	26.00 @ 30.00
Kentucky	4 mos.	26.00 @ 30.00
Missouri	4 mos.	26.00 @ 30.00
Georgia	4 mos.	26.00 @ 30.00
Alabama	4 mos.	26.00 @ 30.00
Assorted Bar Iron	₱ 100	2.00 @ 2.10
No. 1 Railroad	"	.90 @ 1.00
Heavy Cast Scrap	"	.65 @ ....
Light " "	"	.55 @ ....
Old Rails	4 mos.	20.00 @ 20.50
Old Car Wheels	4 mos.	16.00 @ 17.00

CINCINNATI.

Messrs. L. R. HULL & Co., under date of March 9, write us as follows: PIG IRON.—The demand is more active, and some considerable lots have been placed during the past week. Prices, however, range the same with certainly no stiffening or indications of a stronger feeling soon. We continue to quote:

HOT-BLAST FOUNDRY.	
Hanging Rock, No 1, Charcoal	$22.50 @ 23.00
" No. 2, "	21.00 @ 21.50
" No. 1 Coke	22.00 @ 22.50
" No. 2 "	20.00 @ 20.50
" No. 1, Stonecoal	20.00 @ 21.00
Virginia, No. 1 Coke	21.00 @ 22.00
" No. 2 "	19.50 @ 20.00
Ala. and Tenn., No. 1 Charcoal	21.00 @ 21.50
" No. 2 "	19.50 @ 20.00
Shawnee, No. 1 Stonecoal	20.00 @ 21.00
" No. 2 "	19.00 @ 19.50
FORGE IRONS.	
Hanging Rock No. 1 Charcoal	20.00 @ ....
Hanging Rock No 1 Coke	19.00 @ 19.50
Virginia, No. 1	19.00 @ 19.50
Ala. and Tenn. No. 1 Charcoal	19.00 @ 19.50
Red-short, No. 1 Coke	19.50 @ 20.50
Cold-short, No. 1 Stonecoal	17.50 @ 18.00
Old Rails, prime	cash, 20.50 @ ....
CAR WHEEL AND MALLEABLE.	
Hanging Rock	33.50 @ 35.00
Southern and Western Brands	28.00 @ 30 00
ORE.	
Virginia Hematite (Washed)	cash, 4.25 @ ...

LOUISVILLE.

Messrs. GEO. H. HULL & Co., under date of March 10, write us as follows: Market dull, and prices have a downward tendency. Buyers are purchasing for immediate wants only. The usual time, 4 mos., is allowed on quotations below:

FOUNDRY IRONS.	
No. 1 Hanging Rock, Charcoal	$21.50 @ 22.50
No. 2 " "	19.00 @ 20.00
No. 1 Southern, Charcoal	19.00 @ 20.00
No. 2 " "	18.50 @ 19.50
No. 1 Hanging Rock, Stonecoal and Coke	20.00 @ 21.00
No. 2 Hanging Rock, Stonecoal and Coke	18.00 @ 19.00
No. 1 Southern, Stonecoal and Coke	18.50 @ 19.50
No. 2 " "	17.50 @ 18.50
"American Scotch"	20.00 @ 22.00
Silver Gray	17.00 @ 18.00
MILL IRONS.	
No. 1 Charcoal, Cold-short and Neut'l.	17.00 @ 18.00
No. 1 Stonecoal and Coke, Cold-short and Neutral	16.50 @ 17.50
No. 2 Stonecoal and Coke, Cold-short and Neutral	16.00 @ 17.00
No. 1 Missouri and Indiana Red-short	20.00 @ 22.00
White and Mottled, Cold-short and Neutral	14.00 @ 16.00
CAR WHEEL AND MALLEABLE IRONS.	
Hanging Rock, Cold-blast	34.00 @ 37.00
Alabama and Georgia, Cold-blast	24.00 @ 33.00
Kentucky, Cold-blast	25.00 @ 33.00

Messrs. W. B. BELKNAP & Co., Iron and Steel Merchants, Louisville, Ky., under date of March 11th, report trade still unfavorably affected by the condition of country roads. The wet winter has been more severe upon transportation interests than the strikes of last summer. As a further result of the blockade, collections are unusually bad. But there is every reason to expect a decided improvement soon, and meanwhile prices are reasonably well maintained. Mills are running on orders and accumulating no stocks.

BALTIMORE.

Mr. W. N. WYETH, Iron and Steel Merchant, 46 and 48 South Charles street, report us the following prices, under date of March 11, 1878: Trade for the past week has ruled rather more quiet than for some time past, and that doing only to supply immediate wants. Quotations, however, are firmer but unchanged at annexed figures:

AMERICAN REFINED BAR IRONS.		
1 to 6 wide by ⅜ to 1 thick	₱ lb	1.95 @ 2 ¢
1 to 4½ wide by 1½ to 2 thick	"	1.95 @ 2 ¢
Round and Square, ordinary sizes from ¾ to 2 inclusive	"	1.95 @ 2 ¢
Hoop iron, 1½ wide and upward	"	3 @ 3¼¢
Band Iron, from 1¼ to 4 in. wide	"	2¾ @ 3 ¢
Horse-shoe Iron ¾ to 1 wide by ⅜ to ½ thick	"	3¼ @ 3½¢
Norway Nail Rods	"	5½ @ 6 ¢
Black Diamond Cast Steel, Flats, Squares and Octagon, ordinary sizes	"	14½ @ 15 ¢
Machinery Steel	"	8 @ 9 ¢
Cast Spring Steel	"	7½ @ 8 ¢
Homogeneous Steel Plate	"	8½ @ 9 ¢
Perkins' Horse shoes, ₱ keg of 100 lbs		$4.02½
" Mule shoes		5.02½
R. R. Spikes		2¼¢ @ 2½¢
Common Horse Nails	₱ lb	14¢ @ 18 ¢
	10 9 8 7 6	
Putnam Horse Nails	₱ lb 18 19 20 21 23¢	
Globe Horse Nails	₱ lb 18 19 20 21 23¢	

Less list discount to the trade.

Messrs. R. C. HOFFMAN & Co., Iron and Commission Merchants, No. 23 South Frederick street, report the Pig Iron market as follows, under date of March 11: The iron market remains quiet. Stocks on hand light, and prices firm at about quotations:

Baltimore Charcoal Pig	$29.00 @ 30.00
Virginia " "	28.00 @ 30.00
Anthracite No. 1	19.00 @ 20.00
" No. 2	18.00 @ 19.00
" No. 3	17.00 @ 18.00
" Mottled and White	14.00 @ 15.00
Charcoal, C. B. Blooms	50.00 @ 55.00
" " Billets	55.00 @ 60.00
Refined Blooms	45.00 @ 50.00

RICHMOND.

Mr. ASA SNYDER, Iron Merchant and Furnace Agent, Richmond, Va., writes as follows under date of March 11: Prices for foundry grades of Pig Iron are weaker, but a fair business doing at present quotations. Wheel Iron of first quality is scarce and in ready demand. Old Rails are firm at quotations.

Va. Cold-blast Charcoal,	Cold-short	$20.00 @ 24.00
Va. " "	Neutral	28.00 @ 29.00
Va. Warm-blast "	Cold-short	19.00 @ 22.00
Anthracite, American Scotch		23.00 @ 24.00
" No. 1		20.00 @ 21.00
" No. 2		19.00 @ 20.00
" No. 3		18.00 @ 19.00
" Mottled		16.00 @ ....
Coke, (West Virginia) No. 1		21.00 @ ....
" " No. 2		20.00 @ ....
Old Rails		17.00 @ 18.00
Wrought Scrap No. 1		20.00 @ ....
Cast " (machinery)		18.00 @ ..
Richmond Refined Bar Iron		2.00 @ 2 1-10
Horse Shoes per keg		4.50 @ 4.75
Mule " "		@ 5.75
Old Dominion Nails, Standard Size, ₱ keg		2.60 @ ....

Freight to New York and Philadelphia by sail, $1.50 per ton of 2240 lb.

FOREIGN.

FRANCE.

(*Moniteur des Interets Materiels.*)

PARIS, February 24, 1878.—*Metals.*—A better feeling is spreading in business circles in response to the more peaceful aspect of affairs in the East. The metal markets also display a slightly increased activity, without as yet leading to any notable improvement. *Copper* has become quite steady here. We quote, with a satisfactory trade doing, Chili Bars, 175 francs the 100 kilos., Havre delivery; Common ditto, 170; Ingots and Slabs, 175; English Best Selected, 182.50; and pure Corocoro Ore, 177.50. Marseilles remains unaltered at the following quotations: Spanish Slabs, 170; Red Tokat, 170; Small Refined Ingots, 185; Sheathing, 205; Bolts, 210, and Yellow Metal Sheathing, 200. *Tin* has been moderately active and on the whole sustained. We quote: Straits, 174.50 francs the 100 kilos. Marseilles remains inactive; they quote Banca, 185; Straits and Billiton, 170 @ 175; and English Refined, 190, nominally. *Lead* is still in a drooping attitude. We quote the various sorts between 46 and 46.50 the 100 kilos. Marseilles is sustained at the following quotations: First Fusion, Soft, 45; second do., 44.50; and Sheet and Pipe, 51; Shot, 51. *Spelter.*—The markets have been lacking activity, but prices are nevertheless upheld. We quote Silesian, deliverable at Havre, 48.75 francs the 100 kilos.; other good brands, 48.75; and at Paris, 49.25. No change at Marseilles. *Iron.*—The owners of forges in France are becoming more confident in the future. Consumers seem to carry but light stocks, and are evidently compelled to re-enter the market. They are seemingly anxious to secure Merchant Iron to be delivered during the ensuing six months at 160 @ 165 francs, but maker's decline to engage their output beyond the next three months. The tendency of the market is toward increased firmness. In the Ardennes the rolling mills do not yet receive many orders, but their stocks increase but slowly. Hardware manufacturers are only engaged in a small way. Iron for the navy sells at 170 @ 180 francs per ton. In the Haute Marne the foundries have an increase of work on hand since they abated a little from their pretensions. Ironware and small castings are in improved request. Mixed and best quality Iron is fully sustained, but Coke Pig Iron, Hoops and Sheets, as well as thick Sheet Iron, are neglected. In Central France business still leaves a good deal to be wished for. At an adjudication for Sheet Iron, held at Cherbourg on the 16th inst., the Dernain and d'Anzin forges have been the successful competitors, underselling their rivals by 25 to 1 franc. The Montataire forges offered first-class Sheet Iron at 43.88 francs, medium quality, at 35.48, and ordinary at 31.35. The St. Etienne Steel Works have received an order for 500 tons Sheet Iron for railroads. At the North there is an improved outlook. The Iron works are in receipt of a good many commands in that region, but are not prepared to name a uniform price for deliveries during the current year. *Coal.*—At Paris the comparatively mild winter has caused stocks to remain ample on the whole, and the industrial establishments are holding back with their purchases in hopes of doing better in the immediate future. Mixed Coal is however in moderate supply, and in this species we look forward to a speedy improvement. At the North stocks are accumulating and prices rather easy.

BELGIUM.

(*Revue Universelle*).

BRUSSELS, Feb. 24, 1878.—*Iron.*—The almost certainty that the Eastern question will not lead to still more formidable complications begins to inspire the manufacturers of Belgium with more faith in the future, and our Iron and Coal Exchange is wearing a livelier appearance, soon to develop, we trust, into increased activity. If the war in Bulgaria has brought Belgium many orders, we feel confident that peace will bring us a great many more, both from Russia and Turkey. In saying so we have in view more particularly railroad material. The following goods are now in fair request: Sheet Iron, Iron roofs and planking. Our Steel works have been turning out their make most steadily, but they will have to be careful, and guard against overdoing production, unless they are prepared to sell at a loss. Merchant Iron is moving off in moderate quantities. Iron for flooring purposes can be had on rather easier terms. Iron Rails hardly cover the cost of production. *Coal.*—The dullness which for some time past has been characterizing the market, experiences no favorable change as yet. Even at current low prices, consumers still hesitate, and foreign Coal is offering at rates nominally low. The winter, mild as it has been, now being pretty much

brought to a close, the only hope for some favorable change now rests with the expected activity in the Iron districts of Belgum, and in this we trust our Coal companies will not be doomed to disappointment for the reason given above.

GERMANY.

(Borsenhalle).

HAMBURG, Feb. 23, 1878.—*Metals.*—The apprehensions which were entertained up to within a week as to further serious complications to grow out of the Eastern question now rapidly vanish, and people in the metal trade begin to breathe more freely. *Copper.*—This metal has been tolerably active and fully sustained. Berlin quotes the various sorts 72 @ 77.50. We have remained unaltered here. The same may be said as regards Stettin. *Tin.*—Although there has, if anything, been greater firmness, prices are no higher, and still remain the same as lately reported at Berlin, as well as here, and at Stettin. *Lead* is sustained in the German markets, and Berlin remains firm at 18.80 @ 19.20 marks the 50 kilos. for Tarnowitz, Hartz and Saxonian. Hamburg and Stettin inactive, without alteration in rates. *Spelter* has become stagnant, nor do we expect any favorable change for a month to come, when the spring demand may finally come to the rescue of the metal, which certainly seems cheap enough at the rates now current, and even in England remains sustained, notwithstanding the little transpiring in it there. We have no change to report either at Berlin, Stettin or here.

HOLLAND.

(Koch & Vlierboom.)

ROTTERDAM, Feb. 26, 1878.—*Tin.*—The market has been a little firmer, but consumers as a whole do not yet seem prepared to re-enter the market and replenish stocks. We quote Banca, 40 @ 40.25 guilders the 50 kilos., and Billiton on the spot and to arrive, 38.75 @ 39.

EAST INDIES.

(Dummler & Co.)

BATAVIA, JAVA, January 17, 1878.—*Metals.*—During the fortnight elapsed since the issue of our last report transactions have again been of little importance; though in the last few days a slightly enhanced demand was experienced for some articles, the market cannot be said to have generally improved, and it is to be feared that the increasing value of the staff of life will prevent a change for the better for a considerable time to come. *Tin.*—There are to be sold at public auction on the 11th proxime about 10,000 piculs Billiton Tin. *Iron.*—In Swedish nothing has been done; of English only retail sales are reported. *Copper Sheathing.*—A few cases of English have been disposed of at 72.50 guilders and 73 per picul. *Sheet Lead* is in less request, and at lower rates; small parcles have changed hands at 21.50 @ 23 guilders per picul. *Coal* without transactions.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

SHEFFIELD, Eng., Feb. 25, 1878.

THE POLITICAL SITUATION

is still so exceedingly grave and complicated that we can see no chance of any speedy disbanding of the enormous armies which at this moment overshadow the peace of Europe. The whole of this Continent is a camp in which resounds the clash of arms and the din of great preparations for further and more rapacious slaughter. There are, it is quite true, abundant assurances of peace, but as they mostly emanate from sources which have frequently been known to cry "peace, peace" when they were letting slip the dogs of war, we are, on the present occasion, somewhat chary of taking their professions as matters of accomplished facts. We still hope, nevertheless, that this bloody, needless war has come to an end, but our daily reports from Southeastern Europe are such as cast grave doubts on that view of the subject. Pending something definite in one direction or another,

TRADE LANGUISHES

in most parts of the country, and it is only here and there that one hears of any profit being made. The exporting merchants will not speculate until they can see with a clear eye a definitive and distinct percentage at the end of each venture, and the home consumers shrink from "great enterprises" in the face of a probable war of such magnitude. At the same time, and in no respect lessening the veracity of my foregoing remarks, I must remind my transatlantic readers that the British manufacturers are steadily, surely and savagely getting down to what your people term "hard pan." They are feeling the bottom in every respect. Wages are being lowered, time after time, in all directions; materials are being cheapened, more machinery is being brought to bear in manufacturing processes, and the men are being better educated. The general effect of these changes will, I take it, be to restore British goods to markets where they have now to some extent been replaced; to produce certain improvement in the demand, and, when the spurt does set in, to fill order books to overflowing—after which *da capo* 1871–3.

THE "STEAM ENGINE MAKERS'"

Society's 53d annual report appears to be first on my budget of news items this week, *ergo* it shall have premier honors. The society commenced the year with 3938 members and a balance of £16,130, and closed the year with 4124 members and a fund of £16,464, the income of the twelve months having been £8422 and the expenditure £8088. To "defend the hours of labor" a levy of £152 was made to assist the men at Cardiff. The "expenses of the unemployed" were £2964, and the total expenditure averaged £1. 19/2½ per member, the worth of the society being about £3. 19/9 per head. In winding up the report the secretary says: "The society could hearken to the stories about 'losing our trade, if we could learn what foreign country was busy.' All we read of European countries is that almost every trade is at a standstill, and from our own branches in America we have had very desponding reports for a long time, and we regret to say that they have poor prospects of any revival, and whenever that does take place we are quite sure the artisans of that country will take care to secure fair wages for their labor, and those far higher than their English brethren."

ONCE MORE

that much anathematized "American tariff" is slain by a writer in the *Engineer*, who, in commenting on an article which appeared a few weeks ago in one of your Pittsburgh contemporaries, thus holds forth:

"After years of protection the iron trade of America remains such an artificial plant that it cannot exist without the fostering aid of a prohibitory tariff! We ask our contemporary, What has been gained by the American nation in return for the assistance it has lent to its ironmasters? When a speculation does not pay it should be abandoned; and we are unable to see why America should go on propping up undertakings which cannot be made profitable. What can America gain by underselling us? What is the advantage which she would reap if she had millions of dollars of capital sunk in rolling mills and furnaces which did not pay one per cent.? What can she hope from the possession of an army of ironworkers dragging out a miserable existence on famine wages? There is no analogy between the position in which Great Britain is placed and that of the United States. America might be great, wealthy, and free if an ounce of iron were never made within her shores; but the retention of our iron trade is a matter of national life and death to us. America need not sell iron to buy food; we must sell iron or suffer want. Our accumulated wealth is enormous, but it could not last for ever, and sooner or later if we did not make iron for our own use and for others we should be impoverished. But no such calamity could occur to America. She is self sufficing; she can grow food enough for herself and half Europe besides, and the moment she finds that iron making will not pay she should cease to make iron, because the making of it is a thing of comparatively small moment to a nation possessed of vast agricultural wealth. If the money now invested in the iron trade of the United States had been expended in bringing land into cultivation and developing the great resources of the country, America would be richer, happier, and infinitely more contented than she is now.

"British ironmasters may take heart when Pittsburgh wails. An iron trade which maintains a tottering and miserable existence, with all the help of a tremendous tariff, has little chance of a prolonged life; and our contemporary may rest assured that America cannot make iron as cheap as British ironmasters will make and sell it before they retire from the competition. As we have said, we must make and sell iron. America has no such necessity, and it is easy to see that, do what American ironmasters may, the end will be the same. They will be undersold by England until capital is driven out of the American trade, and its dimensions are reduced to reasonable limits, and its operations confined to the remunerative production of those special brands for which certain districts have long enjoyed a high reputation; and the end is probably not far off. Already the American iron trade is contracting. In the whole of Missouri and its borders not a pound of iron is being made, 23 furnaces having been put out of blast. Let but a moderate reduction be made in the tariff—and there is every prospect that the free-trade party will achieve at least a partial success—and the well-blown bubble will burst, and the iron trade of the United States will recede to the legitimate limits which we have indicated."

There is a capital demand for Bessemer material of all kinds. Ingots are selling at £4. 12/6 @ £5, sheets at £11 @ £13, and various rolled shapes at £7 @ £10 ℔ ton. Rails, as heretofore, remain at and just below £6 ℔ ton, and are being largely produced on all sides, with the exceptions which have been recently mentioned in these reports.

There is a better demand, on the whole, for cast steel, several houses being now much better engaged than they have been for many months past. Some of this activity, there can be no doubt whatever, is owing to the giving out of good government orders.

The principal passages in the annual report of Brown, Bailey & Dixon, Sheffield Steel and Iron Works, are these: "The directors, in presenting their report for the year ending December 31, 1877, congratulate the shareholders on the accompanying balance sheet, which shows a net balance of profit of £29,587. 9/6 on the year's trading. This amount, it will be observed, extinguishes the balance to the debit of the profit and loss account, and leaves £1439. 4/3 to be carried forward to the present year. Having regard to the great depresson in trade and the severe competition which have existed during the period to which these accounts apply, the directors think this result will be considered highly satisfactory by the shareholders. The additions and improvements to the plant, referred to in the last report, have fully realized the expectations of the directors as to the increased power of manufacture, and the output has been very largely augmented thereby. The directors refer with satisfaction to the present high state of efficiency of the machinery and plant, and to the considerable orders on the books; and are encouraged to hope for favorable results for the current year." The manager of this concern "knows his way about" as well as most men in the Bessemer trade. The Rotherham, Masboro' and Holmes Colliery Company, near Sheffield, which in 1873–4 paid a dividend of 80 % is now obliged to issue deferred warrants in payment of its preference interest due on January 1 last.

SHEFFIELD EXPORTS TO THE STATES

are now again on the increase, as is shown by the appended figures which have been courteously furnished to me:

March, Quarter of	Total Value.	Steel.	Cutlery.
1875.....	£185,207	£82,651	£56,454
1876.....	117,780	49,464	33,586
1877.....	102,354	43,352	36,257

These figures show a falling off up to the end of March last, but for the December quarter of 1877 the figures are:

Total Value.	Steel.	Cutlery.
£131,400	£61,715	£39,580

or an increase, as compared with the same period of 1876, in steel, of £10,000, and in cutlery of £11,000. During January, 1878, the figures were below those of 1877, but during the present month I believe I am correct in saying there has been a revival, so that for the whole of the present quarter the comparison is likely to be favorable to this year.

SOUTH STAFFORDSHIRE AND BIRMINGHAM

again present no novelty, all branches of the local iron trade being still very quiet, and prices, as heretofore, purely nominal on the basis of £8. 10/ for marked bars. The girder rolls lately owned by G. B. Thorneycroft & Co. have been refixed at the Round Oak Works of Earl Dudley, where iron of that class will be rolled from 1½ inch to 12 inches. A document of some interest bearing on the trade of Birmingham was issued the other day, and shows that the deposits last year in the local banks reached £10,142,936, or £421,309 below 1876, while the "overdrafts" amounted to £6,041,075, an increase of £470,155. The quantity of goods carried by the three railway companies from the town had been 973,611 tons, or 23,569 tons over 1876. The coal traffic had been 566,535 tons, or 9372 below the year before. The other minerals had totaled 119,583 tons, an increase of 19,157. The chairman of the finance committee, Mr. R. Chamberlain, in presenting this return estimated the profits upon local trade for the year ending April 1, 1878, at £3,969,000 or £323,000 under 1876–7. It is only just to say that several members of the corporation question the accuracy of these figures. In hardware there is rather more doing, but it is denied that an order for 150,000 rifles has been placed in Birmingham at all. From Ohio and Philadelphia good orders are to hand for band saws of French make.

SOUTH WALES AND MONMOUTHSHIRE

are very inanimate in respect of iron orders, but a considerable importation of Spanish ore is in progress at Cardiff. The tin-plate workers in several cases are under notices of reduced wages. Mr. Crawshay's furnaces are producing roller pig iron. Mr. Robert Crawshay is, however, lying paralyzed at the Paddington Station, London, and is not likely to recover. The Welsh coal trade is brisker, government orders having been given out for about 100,000 tons for the Mediterranean and elsewhere. The Blaina collieries have been leased by John Lancaster & Co., of Wigan, and it is rumored that they also intended to lease the blast furnaces.

THE METAL MARKETS

have been almost unaltered, with no large amount of business doing in any branch.

Von Dadelszen & North say: "*Copper.*—The market is quiet. In Chili bars a moderate business has been done, at £65. 15/ @ £66, market closing dull; G. O. B. quoted £65. 10/ @ £65. 15/. Australian: At the public sale of Wallaroo, on Tuesday last, the 590 tons oake sold at an average of £75. 16/1, and the ingots at £76. 5/10, present quotation £76; Burra has been sold at £74. English ingot copper, £70 @ £71; select, £71. 10/ @ £72. 10/; strong sheets, £76. *Tin* has been in fair demand at improved values; Straits and Australian, £63. 10/ @ £64; English ingots, £67 @ £68. *Tin Plates* offering at very low prices. *Lead* dull; English pigs £18. 7/6 @ £18. 12/6; soft Spanish, without silver, £18 @ £18. 2/6. *Spelter*, £18. 15/ @ £19. *Quicksilver* declined 2/6; present price £7. 2/6. *Antimony* £50 @ £51."

The *Mining Journal* remarks: "*Copper.*—The state of our market has not undergone any material alteration, and there has been a fair amount of business done at very fair prices. Chili bars for the most part have ruled about £65. 15/ for G. O. B.'s., and £66 for named brands. Australian has been very well placed. Burra £63. 10/ @ £64, and Wallaroo £75. 7/6 @ £76. 7/6 for cakes and ingots respectively. *Tin.*

THE WEEK'S FAILURES

included those of William Wood, merchant, Bradford, whose debts were £30,000, of Thomas Williams, Small Heath, Birmingham, owing £56,000, and of Benjamin Parker, contractor, Westminster, London, owing £58,000, There have also been several "hitches" in the corn trade at Belfast and in London. The creditors of Messrs. Cook, Hillman & Co., of Redheugh Iron Works, near Newcastle-on-Tyne, met the other day, and the liquidation of the firm was resolved upon, the liabilities being £22,403. 7/5, and the assets £3916. A further meeting of the creditors of Thomas Vaughan & Co., of Middlesborough and other places, was held last Wednesday for the purpose of "hearing the explanations of the trustee in liquidation as to why no dividend had been declared in the estate." The trustee explained that the works had been carried on for the benefit of the creditors since August, 1876, and had lost £4000. The realizable assets had also decreased in value from £100,000 @ £78,000. The meeting passed a resolution authorizing the realization of the estate at once, but it was thought that 2/6 in the pound would be the outside dividend.

THE MINERS

in various parts of the country are again feeling the effects of the current depression, inasmuch as their busy season is now waning and the owners are promulgating further reductions of wages. The Fife, Clackmannan and Kinross coal masters have given notice for a drop of 5 %, and in Derbyshire many of the leading proprietors have lowered the rates of payment by 10 to 12½ %. In South Yorkshire a further drop of 10 % will in all probability result from a meeting of the Associated Coal Owners, called for this day week in this town. Mr. Crawford, secretary of the Miner's National Union, as well as of the Durham Miners' Association, has written a letter on the "coal trade crisis," in which he maintains that the evil "we in this country have to fear is not foreign competition, but the competition among our own capitalists—men who go mad and rush into a business where they are not wanted." This is, perhaps, a blunt way of putting it, but I am not altogether sure that Mr. Crawford is egregiously in error. The meeting of

THE IRON AND STEEL INSTITUTE

will be held in London March 27, 28 and 29, and not on the past two days of February, as stated by me in a previous letter, owing to an erroneously printed circular.

SCOTCH PIG IRON

has been fairly steady, but cannot be called strong at late rates. There are now 87 furnaces blowing against 119 this date last year, and there are 170,373 tons in Connal's stores, or a decrease of 238 tons during the week. In the same period 5290 tons of Middlesborough pig iron were imported into Scotland, making a total for this year of 36,766 tons, or 5641 tons fewer than last year to date. The total Scotch pig shipments are so far 117 tons under those of last year. Writing from Glasgow, Feb. 22, Messrs. James Watson & Co. said: "The market for Scotch pig iron warrants opened buoyant this week, the price advancing on Monday from 51/6 to 51/9, cash; on Tuesday the improvement was lost and the market receded to 51/5, cash, closing in the afternoon a shade firmer at 51/6 per ton. On the two following days the market was quiet at 51/4 to 51/5, cash, while to-day it is steady at the latter figure, closing rather sellers." Shipments last week were 5722 tons against 5839 tons in the corresponding week of 1877. We quote:

	No. 1.	No 3
G. M. B., at Glasgow	52/3	50/6
Gartsherrie, "	59/6	54/
Coltness, "	64/6	55/9
Summerlee, "	58/6	52/3
Langloan, "	62/6	53/9
Carnbroe, "	54/	52/3
Calder, at Port Dundas	58/	51/9
Glengarnock, at Ardrossan	58/3	53/6
Eglinton, "	53/	51/3
Dalmellington, "	53/	51/6
Shotts, at Leith	60/6	56/
Kinneil, at Bo'ness	54/6	51/6

Messrs. William Colvin & Co. and John E. Swan & Bros. are in accord with the above quotations. The Scotch malleable iron trade is a little stronger, but all prices are weak. At the Motherwell Iron Works of the Glasgow Iron Company, the engineemen's wages have been lowered 2/ and the steam hammer men 1/ per week. At the Dalziel Iron Works the men have been lowered 10 per cent., and in both these cases the working hours have been made 57 in place of 54 weekly.

Last week's shipments from the Clyde included pipes, tubes and other castings to the value of £11,500, mostly for Rio de Janeiro; machinery worth £4500, malleable and wrought iron worth £1200, bolt and nut rods worth £1000, sewing machines, £2460, and £700 miscellaneous iron.

THE NORTH AND NORTHWESTERN DISTRICTS.

In the Cleveland district there are now no fewer than 56 furnaces out, those of six firms being altogether idle. It is stated that during the month of January not a single ton of iron rails was shipped from Newcastle, Middlesborough or the Hartlepools, and the exports of pig iron from Middlesborough during the same month fell off to the extent of 7000 tons as compared with the total for December. Of merchant iron there were shipped from Middlesborough 702 tons only during January as against 3200 tons in December. As an example of the increased work done of late by each individual furnace it is stated that the average of the district has been raised within two years from 45 to 56 tons per furnace per diem. The Star Rolling Mills, of Teasdale, Bargate & Co., Middlesboro', are closed and will shortly be sold by auction. In the Northwestern district matters are quiet. At Barrow 10 of the 16 furnaces are going, at Millom 4 out of 6, and elsewhere about 50 per cent. of the total number are in blast. The Furness Company, Askham, however, have all at work.

TRADES OF SHEFFIELD.

There has been, on the whole, a better feeling in most branches of the leading local trades during the week. The successful negotiations which have been conducted by the large local employers and their men have helped this. Last week I was enabled to chronicle the fact of the employees of the Midland Iron Company having accepted a reduction of 7½ per cent, and a similar drop has been agreed to by the puddlers and other iron workers of John Brown & Company, Charles Cammell & Company, and William Cooke & Company. The employers, represented by Mr. J. Ellis, of the Atlas Works, asked the men to make the concession at once, and after some discussion that course was agreed to, thus making a total drop in wages of 12½per cent. during the present year's working.

In pig iron and raw materials there has been no special change in either direction in prices. There is a fair demand for bars, flats, round, and wire rods, common qualities at £5. 15/ @ £6. 5/, and a fair medium iron at £7. @ £7. 5/ per ton. In nail rods, &c., Belgian competition is very close, the quotations of a large Charleroi house being as under: Bars, rounds, squares, or slit nail rods, common, £5. 5/ @ £5. 7/6; best, £5. 12/6 @ £5. 15/; best best, £6. 2/6, @ £7.; treble best, £7 @ £8; hoops, £6. 15/ @ £7. 10/; angles, T's, £7 @ £7. 15/; plates for ships, &c., £7 @ £7. 15/; boiler plates, £8 @ £8. 2/6; Milan steel 3-16 in., £14. 17/6; ¼in., £14. 12/6; 5-16 in., £14. 6/; ⅜ in., £13. 15/; ½ in., £13. 2/6, and so in proportion, and for lots, in each instance, of not less than ten tons.

During the past week foreign tin has advanced to £64 ℔ ton, since which prices have again slightly receded, but the market just now is rendered liable to sudden fluctuations more than usual. *Spelter.*—Very little business has been transacted in this metal during the week, and prices have shown scarcely any variation; £18. 15/ has been quoted for ordinary brands, and £19 for named brands. *Lead.*—This metal has been very quiet, and prices are gradually falling, £18. 5/ @ £10/ being quoted for English pig, and sheet lead is reduced to £19. 10/ ℔ ton. *Quicksilver* has been reduced to £7. 2/6, but there is no improvement in the demand."

Thomas Bond & Co., Liverpool, say: "*Tin Plates.*—Prices are unaltered, and very little inquiry. *Tin* is about steady, and only a moderate business done. Straits and Australian £63. 15/ in London. *Copper.*—The tone is slightly easier. *Lead* is dull at about previous rates."

The San Francisco *Scientific Press* expresses the following opinion respecting scythes: The disposition of steel in a scythe is to be best understood by seeing one which has been broken across the blade. Sometimes tools of this class are steeled "naked," so that all the steel shows itself at once on the top side of the blade, but this plan is not to be recommended. It is better to have iron on both sides of the steel which just shows itself along the edge, and runs in toward the back to stiffen the blade and to form a constant cutting edge as the tool wears away. Now in buying a tool, bear in mind that the most steel may show in the one steeled naked, because all that is there is in sight, but in the other case there would be a great deal more steel useful for carrying an edge, although it would show less because the bulk of it would be hidden between the iron. It will not do, then, to be deceived by appearances. The best plan is to depend on a good maker for good steel and sufficient of it.

The Duration of Steel and Iron Rails.

The Institution of Civil Engineers issues the following abstract of an article in the *Zeitschrift des Berg-und Hüttenmännischen Vereines für Kärnten* on the above-named subject:

The following figures refer to the main line of the Cologne-Minden Railway, which has a total length of way of 1357 miles, or double that length of rails in use, exclusive of colliery sidings. At the end of 1876 more than 90 per cent. of the whole was laid with steel, the substitution for iron having been in progress since 1864. The effect of this on the maintenance of the line is seen in the following table:

Renewals in	1870.....	7.75	per cent. of total length.
"	1871.....	8.77	" "
"	1872.....	7.55	" "
"	1873.....	8.40	" "
"	1874.....	4.33	" "
"	1875.....	1.04	" "
"	1876.....	1.13	" "

The rate at which the actual substitution of steel for iron proceeded is given in the following table, representing the number of Bessemer steel rails laid down and removed in each year since 1868:

Year.	Rails in use at end of Year.	No. of Rails laid during Year.	Removed as useless during Year.	Per cent. of length in use.	Rails broken before laying.
1868	1,853	.....	..	....	..
1869	21,867	20,014	31	0.142	3
1870	78,259	56,392	20	0.025	4
1871	139,618	61,359	54	0.039	18
1872	222,844	83,226	93	0.042	41
1873	340,300	117,456	342	0.101	173
1874	452,650	112,350	738	0.158	8
1875	504,634	51,984	347	0.069	2
1876	514,801	10,167	310	0.060	2
			1,935	0.376	251

Out of the total of 1935 rails rendered unserviceable, 1204 broke through the full section, 227 through the fish-bolt holes and 504 were otherwise damaged. That the number of removals does not increase, but has substantially diminished since 1874, is accounted for by the fact that these removals are necessitated not so much by wear as by defects in manufacture, which are usually discovered within a short time after the rail has been laid.

In order to obtain accurate data as to the comparative efficiency of different classes of rails, a number of samples from different makers were laid on a part of the line having the heaviest traffic, near the Oberhausen station. The experiment commenced in 1864, and the results obtained up to the end of 1876 were as follows. The rails were all of the same section, called Calibre IV., and 5650 millimeters area:

Description of Rail.	Laid 1864.	Rem'g 1876.	Av'r'ge wear of head.	Remov'ls in 12 y'rs.	
	No.	No.	Millim.	No.	Pr ct
Fine-grained iron from Friedrich-Wilhelm-Hütte, Troisdorf	190	29	....	122	80.66
Case-hardened ir'n from Phönix-Hütte	150	48	4.44	102	68.00
Puddle steel, Funke & Co., Hagen.	12	8	4.72	4	33.33
Puddle steel, E. Hösch & Sons, Lendersdorf	12	8		4	33.33
Bessemer steel, E. Hösch & Sons	149	142	5.22	7	4.70
Bessemer steel, F. Krupp	147	141	5.18	6	4.08
Bessemer steel, Hörder Verein	150	148	4.18	2	1.33

The average wear of the experimental Bessemer rails is 4.86, which represents the effect produced by the passage of 6,500,000 axles of passenger and goods trains, or about 1,340,000 axles for each millimeter of wear.

Western Lead.—The Joplin (Mo.) *Mining News* of Feb. 23 says: In conversation a few days ago with a gentleman who is largely interested in Colorado mines, he stated that the large importation of lead which, for the past six months, has come from the West would soon cease, and in the future the market would be supplied with the ore produced east of the mountains. His reasons for this are that it will not pay to mine lead in the Western mines, even though a large percentage of silver is found in connection with the ore. Lead must be handled in a manner so far different from silver that it is necessary to smelt it and work it the same as though no silver was connected with it. Those miners who had undertaken to save the lead and ship it East, have discovered that the loss was so great that it reduced the profits on silver instead of increasing them, as they anticipated. Their lead only brought on an average $4 in New York, and it cost more than this to pay transportation to the railroad, freights and other expenses; consequently what was lost on lead had to be met with the profits from silver, which of course caused the silver to cost more than if the lead had never been handled. Just as it was here when black jack was worth but $3 a ton, miners could not handle it, as their time could be more profitably employed in mining lead. It has been the cry of consumers of lead that they could purchase Colorado ore at such low figures that they found more money in it than in any other, but those Western miners having discovered that they cannot place their lead on the market except at an actual loss will stop mining it, and the result will be a revival in the price of lead produced nearer the consuming centers.

A new grate bar is attracting attention in England. The bar is of an angle section, the top portion, which forms the grate on which the fire rests, being provided with a number of diagonal slots, giving a uniformly distributed admission of air throughout the whole grate surface. This arrangement facilitates the complete combustion of the fuel, smoke being entirely prevented and the whole of the heat-producing portion of the coal consumed in the furnace. The bars are so light in section that they cost no more per square foot of fire grate surface than ordinary fire-bars, while at the same time they are much more durable. The bars seem designed on sound common-sense principles.

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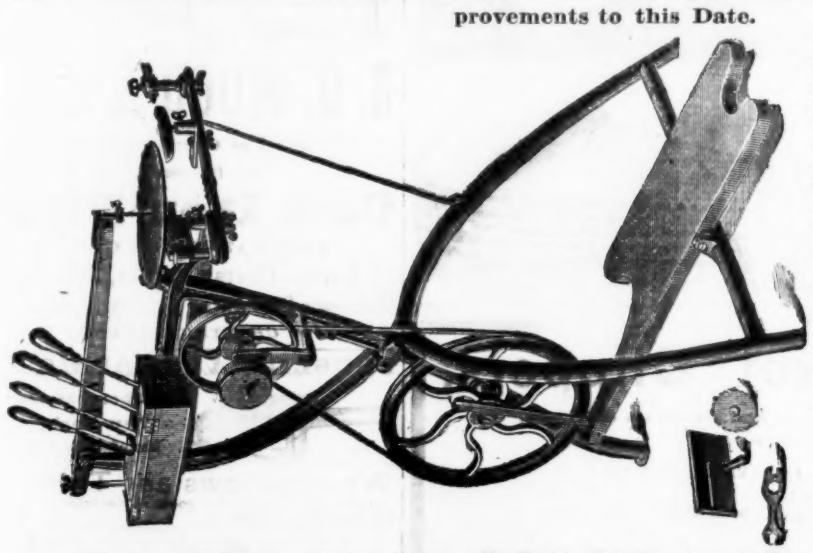

It is handsomely painted red and green, with red stripes, and presents a beautiful appearance. Those parts which are not painted are either polished or japanned. We warrant the Saw to be just as herein stated, and we know it will give entire satisfaction, being a more expensive machine than those which we formerly sold for $25. It consists of—

1st.—A SCROLL SAW, with Tilting Table for inlaid work; arms 18 inches in the clear; clamps which will hold saws of any length or width, and face them in four different directions; cutting lumber from 1-16th to 1 inch in thickness; speed, 1000 strokes per minute.

2d.—A CIRCULAR SAW, 2¼ inches in diameter, which will cut lumber one-half inch and less; with an iron table, 4 by 5 inches.

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4th.—An EMERY WHEEL, with wide and narrow rim.

5th.—A TURNING LATHE, with iron ways and rest, steel centres, and three best steel turning tools; length of ways, 15 inches; distance between centres, 9 inches; swing, 3 inches; length of slide-rest, 4½ inches; number of revolutions per minute, 7000.

Also, with each machine, six Saw Blades, a Wrench, Screw-driver, extra Belt, and two sheets of Designs, with a nice box for the small tools, and a box for the whole machine. It is taken apart when shipped, and packed in a box, but the working parts are all left in place, and the frame is put together again by a single bolt.

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The same, without the Lathe and Circular Saw, $6.00.

When desired, we furnish with the Lathe a very nice Drill Chuck, for working metal, and a Tail Stock, with a screw centre, for $2 extra. The machine alone weighs 47 lbs., and, with the box, 70 lbs.

We also keep a full stock of Tools and Supplies in the Bracket-Sawing line.

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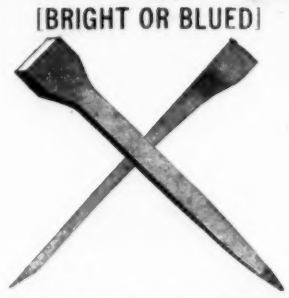

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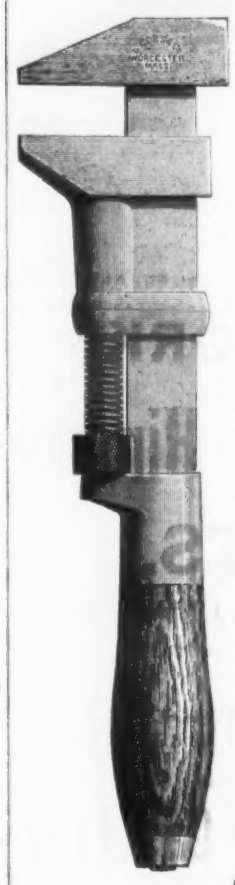

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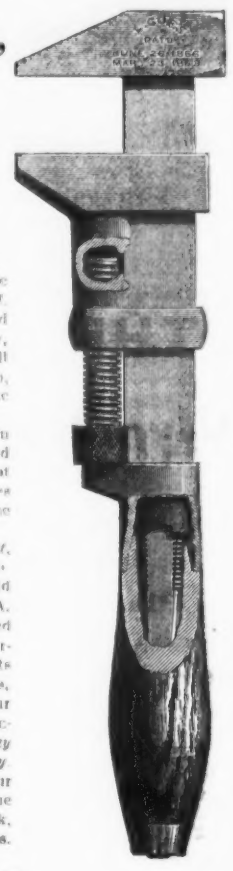

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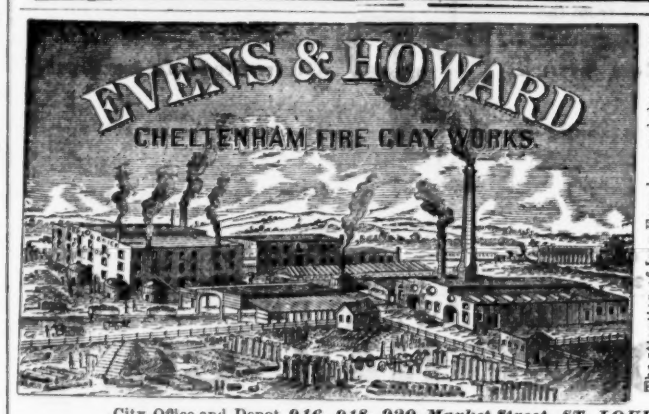

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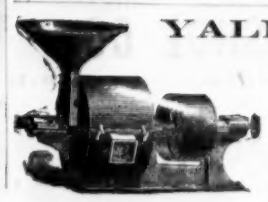

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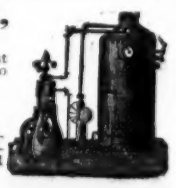

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Hammered & Finished Horse Nails.

We offer our Finished Nail to the trade with the confidence that it has no equal in the market. It is the genuine "Northwestern" Nail, Finished, and we give it our unqualified guaranty.

Office and Factory, 56 to 68 Van Buren St., Chicago.

A. W. KINGSLAND, Secretary.

Our agents, Graham & Haines, 113 Chambers Street, New York, carry a full line of our goods, and will be pleased to serve you at Factory prices.

GLOBE NAIL COMPANY,

MANUFACTURERS OF

Pointed Polished & Finished Horse Shoe Nails.

Recommended by over 20,000 Horse Shoers.

All nails made from best NORWAY IRON, and warranted perfect and ready for driving. Orders filled promptly and at lowest rates by

GLOBE NAIL CO., Boston, Mass.

RHODE ISLAND HORSE SHOE CO.,

OFFICE, 81 Canal Street, Providence, R. I. **WORKS at Valley Falls, R. I.**

Manufacturers of

PERKINS and RHODE ISLAND PATTERNS of

HORSE AND MULE SHOES.

McNab & Harlin Mfg. Co.,

MANUFACTURERS OF

BRASS COCKS AND VALVES

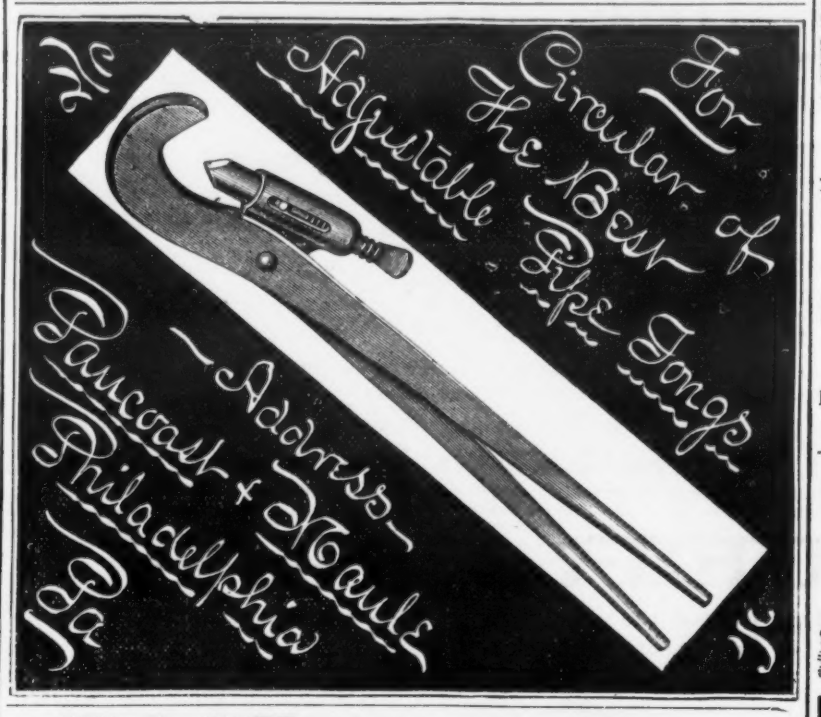
For STEAM, WATER and GAS.

Iron Pipe and Fittings, Plain and Galvanized.

PLUMBERS' MATERIALS.

New Illustrated Catalogue and Price List sent by express to the Trade on application.

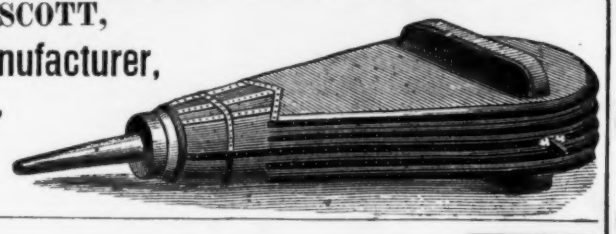
Factory, Paterson, N. J. 56 John Street N. Y.



GEO. M. SCOTT,

Bellows Manufacturer,

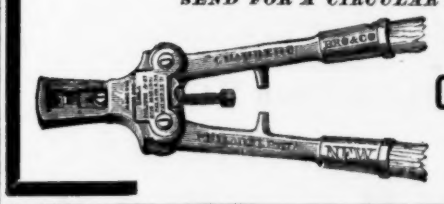
Johnson Street,
Cor. 22d St.,
CHICAGO, ILL.



Bolt and Rivet Clippers,

For cutting off the ends of bolts and rivets, on carriages, wagons, harness, &c.

SEND FOR A CIRCULAR AND PRICE LIST.



Liberal discount to the trade.

Chambers, Bro. & Co.,

PHILADELPHIA.

CHAMPION BARROWS.

WITH WOOD OR IRON WHEELS.

A first-class article and a specialty, that will make a demand in any market and afford a good margin to dealers. We are prepared to furnish them in large quantities. Manufactured by

BRYAN MANUFACTURING CO., Bryan, O.

SEMPLE & BIRGE MFG. CO., Sole Western Agents, ST. LOUIS, MO.

For Sale by THE NEW YORK PLOW CO., General Eastern Agents, 55 Beekman St., New York.

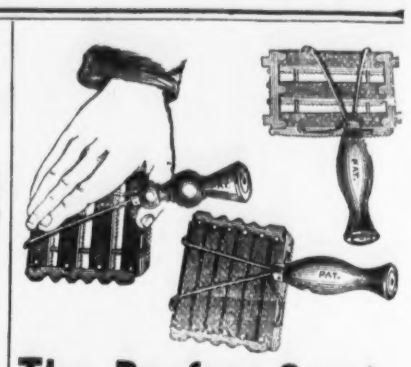
THOS. MEIKLE. **BARRY COLEMAN,** Late Vice-President Louisville Rolling Mill Co.

THOS. MEIKLE & CO.

Louisville, Ky.

STEEL AND CAST PLOWS.

Send for Illustrated Catalogue.



The Perfect Comb.

We call your attention specially to our new patent endless wire frame comb. The result of a long series of experiments, made with a view to meeting all the requirements of a *Perfect Comb.* It is better, stronger, and more durable than any ever before invented. The raised wire shank gives what has never before been attained, viz: a rest and brace for the thumb, in such a position that the hand cannot come in contact with the horse while using the comb. The wire braces which run from the shank over the back to the front teeth give strength and durability in a direction never heretofore attained, and at the same time serve as an extra handle; and when clasped by the fingers in connection with the raised shank the comb is more firmly, easily, and completely held, and with much less fatigue to the hand than is possible in any other formation—in short, it needs but a trial to vindicate its name: **The Perfect Comb.**

THE LAWRENCE COMB CO.

Factory and Office,

382 2d Ave., cor. 22d St., N. Y.

WM. S. CARR & CO.

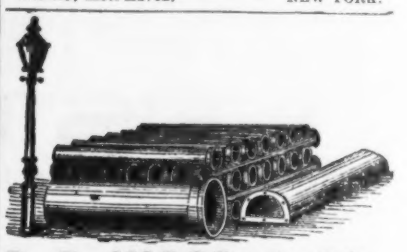
Sole Manufacturers of

CARR'S PATENT **Water Closets,**

PUMPS, CABINET WOOD WORK, &c.

106, 108 & 110 Centre Street,

Factory, Mott Haven, - - - NEW YORK.



R. D. WOOD & CO.,

Philadelphia,

Manufacturers of

Cast Iron Pipe

FOR WATER AND GAS.

Lamp Posts, Valves, &c.,

Mathew's Pat. Anti-Freezing Hydrants.

400 CHESTNUT STREET.

PUGSLEY & CHAPMAN,

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Manufacturers of

Wheelbarrows and Trucks.

so different styles. Good goods at low prices. Send for illustrated circular.

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TENNIS & WILSON Agents, 81 Beekman Street, N. Y.

HOVEY'S

Common and Angular

BORING MACHINES

Are the Cheapest and Best.

Send for Reduced Price List to

H. N. HUBBARD,

Manufacturer,

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CARRIAGE TRIMMERS' TOOLS.

GAS PLIERS, Extra Quality.

TACKLE BLOCKS

BURR & CO.,

Manufacturers of Waterman and Russel's

Patent Iron Strapped Blocks,

ALSO, MANUFACTURERS OF

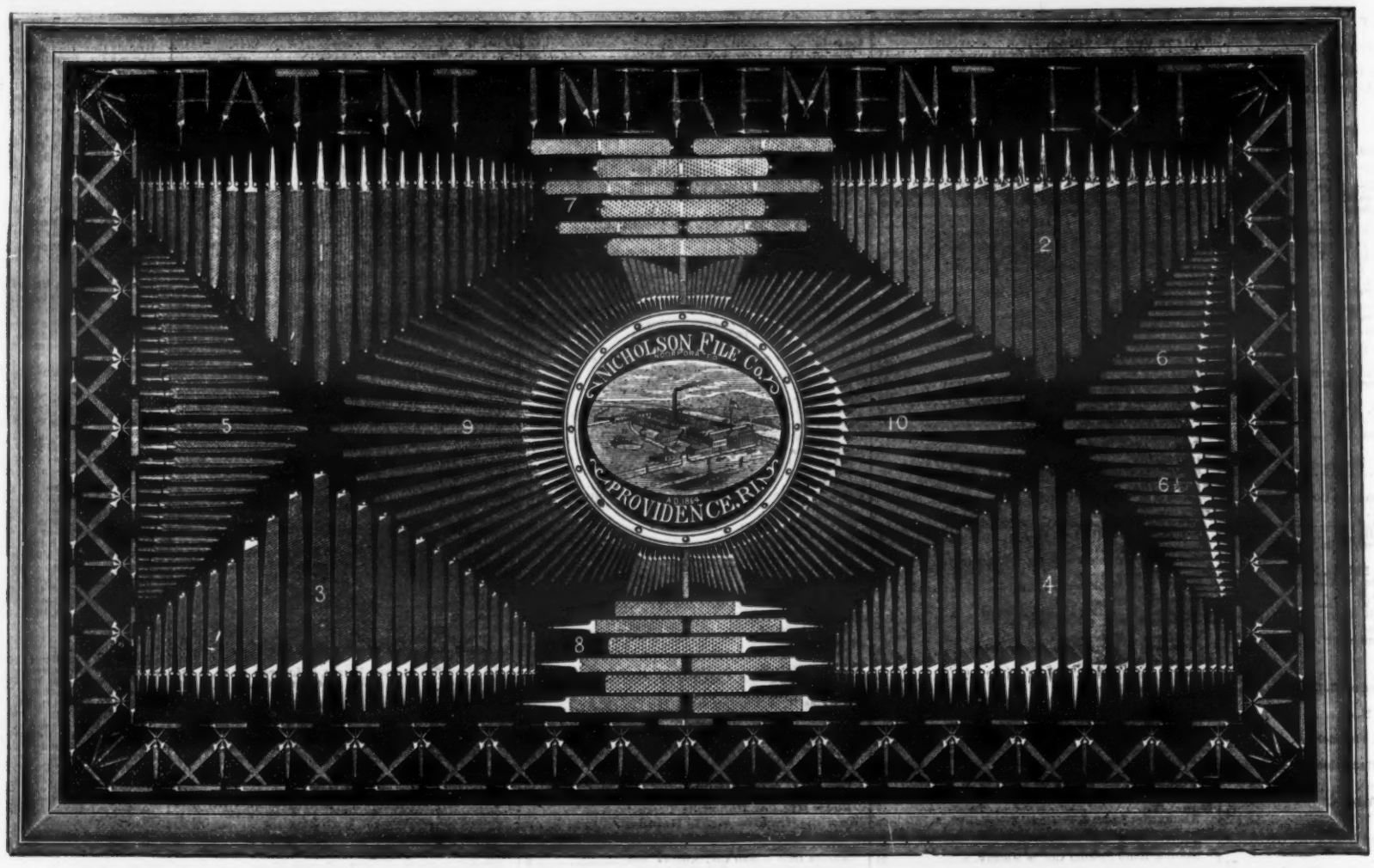
ROPE STRAPPED BLOCKS.

11 PECK SLIP, NEW YORK.

The Iron Age Directory

and Index to Advertisements.

NICHOLSON FILE COMPANY, Providence, R. I.



KEY.

1.–Half Round. 2.–Hand. 3.–Mill. 4.–Flat. 5.–Triangular. 6.–Pillar. 6½.–Knife. 7.–Plain Rasps. 8.–Tanged Rasps. 9.–Round. 10.–Square. 11.–Borders.

In addition to above we manufacture **FILES AND RASPS** of every description and kind known to the trade. These goods are not excelled, and by a large proportion of both **Consumers** and Dealers are admitted as superior to any either of **Foreign or Domestic Manufacture.** We are constantly improving and adding to our machinery, and by carrying a stock of from 30,000 to 50,000 dozen Files on our shelves at all times, we are enabled to fill orders with the utmost dispatch, thereby saving both loss of **Trade** and **Interest** to our customers.

For several months past we have been engaged upon a **Catalogue** and **Treatise,** illustrative of the **File and its Uses,** which we hope soon to have ready for distribution. In this work we expect to introduce several new and important appliances connected with the uses of the File.

MORTON
Oil Pump.

The only absolutely
SAFE OILER.

By the simple pressure on the valve, the Oil is delivered in the exact quantity desired (from one drop to a spoonful), exactly on the bearing with no possibility of clogging.

In ordinary factories the saving will pay for the Oiler in sixty days.

Send for circular.

MORTON OILER CO.,
Biddeford, Me.

PATENT

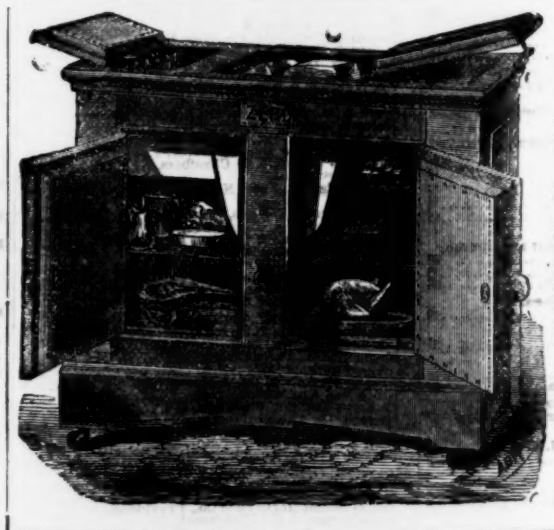
DRIPPING AND BREAD
PANS;

Budke's Patent Sheet Iron
MEASURES.

Black and galvanized House, Steamboat, Stable and Well
BUCKETS.
Powder Kegs, Paint, Putty and White Lead
PAILS.

Also Cold Rolled Sheet Iron, Bar, Sheet and Tank Iron and Nails.

LEWIS, DALZELL & CO.,
Pittsburgh, Pa.



"ZERO"
Refrigerator.

Centennial Award, 1876. 35,000 in use. The best food and Ice keeper in the world. With Water, Wine and Milk Cooler.

IMPORTANT TO HOUSEKEEPERS.

The Zero Refrigerator was awarded the Highest Premium by the Centennial Exhibition.

Report.—1st. Beauty of design and excellent workmanship. 2d. Absence of all communication between the ice and provision chambers. 3d. Absence of moisture on the inside lining. 4th. Impossibility of contact of hot air with the ice. 5th. The condensation of moisture on the cold surface of the ice box. 6th. Economy of ice and uniformity of temperature. 7th. The filling with cork.

Also the POLARIS, NEWPORT and SARATOGA COOLERS, for the sick room, persons boarding, offices, etc. The "Zero" Market, Pic-nic and Fishing Baskets, for carrying Meats, Fruits, Fish, etc.

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226 W. 23d St., New York.
Send for price list.

MICA.

Miners of and Dealers in MICA of all Sizes.

MICA TO ORDER IN ANY PATTERN.

As we own extensive mines at Chester, Mass., and also in North Carolina, Stove Manufacturers and Hardware Jobbers are invited to communicate with us before contracting elsewhere.

THE CHESTER MICA & PORCELAIN CO.,
OFFICE, 87 Liberty Street, New York.

"TORREY'S DOOR SPRINGS"

P. R. DUNNE,
[Successor to E. S. & J. TORREY,
SOLE MANUFACTURER,
182 Fulton St., New York.

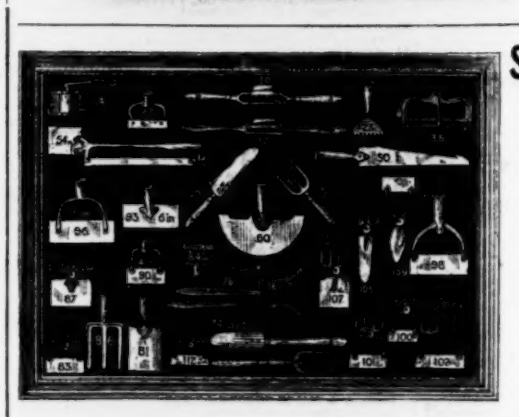
AND

Ice Cream Freezers.

F. W. SMITH, President. WARREN H. DAY, Sec'y and Treas.

THE
SMITH & EGGE MFG. CO.,
MANUFACTURERS OF
Government and Giant Padlocks,
Sewing Machine Locks,
Automatically Made Sash Chains,
Sash Fixtures.

Specialties in Hardware and Light Metallic Goods generally.
SPECIAL LOCK COMBINATIONS.
P. O. Lock Box No. 105. BRIDGEPORT, CONN.



Sedgwick Mfg. Co.

Nos.
14, Door Spring.
22 and 23, Carpet Stretchers.
30 and 32, Spoke Shaves.
35, Saw Sets.
50 and 54, Pruning Saws.
60, Edging Knives.
70, Garden Trowels.
75, Weeding Forks.
76, Garden Reels.
74, 80 and 84, Garden Sets.
90 and 96, Shuffle Hoes.
93, Sedgwick Shuffle Hoes.
98, Floor Scraper.
100, 101, 102, 105, 107, 109 112 Hoe and Rakes.

POUGHKEEPSIE, N. Y.

CLOTHES WRINGER!

Steel Elliptic Springs.
Self-Adjusting.

T. J. ALEXANDER, Manager,
BOSTON, MASS.

Heinz, Pierce & Munschauer,
BUFFALO, N. Y.
Manufacture a full line of
JAPANNED & BRASS CAGES,

All of which are manufactured under latest patents &c. Illustrated catalogues sent to the trade on application. Also a full line of **HOUSE FURNISHING GOODS.**

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HIBBARD, SPENCER & CO., Chicago, Ill.
CHICAGO STAMPING CO., " "
SIMMONS HARDWARE CO., St. Louis, Mo.
MACOMBER, BIGELOW & DOWSE, Boston, Mass.
J. MACKLEY & CO., Dubuque, Iowa.
SICKELS, PRESTON & ADAMS, Davenport, Iowa.

G. W. Bradley's Edge Tools.

Butchers' Cleavers,
Butchers' Choppers,
Axes and Hatchets,
Grub Hoe and Mattocks.
Mill Picks
Gox Chisels and Scrapers
Ring Bush Hooks,
Axe Eye Bush Hooks,
Socket Bush Hooks,
Watt's Ship Carpenters' Tools.
Carpenters' Drawing Knives,
Coopers' and Turpentine Tools

FOR SALE BY
MARTIN DOSCHER Agent, 96 Chambers Street N. Y.

Daman
STANDARD HOLLOW AUGERS.

C. C. HARLOW & CO.,
BRIDGEWATER, MASS.,

Manufacturers of DAMAN STANDARD HOLLOW AUGERS.—Universally acknowledged superior to any other in the market. They have recently been improved, making them, as now offered to the trade, the most perfect tools of their kind, either in design, material or workmanship. SPOKE AND DOWEL TRIMMERS.—The very best as well as the cheapest. METALLIC COMBINATION PLOW PLANE.—Made of solid cast steel and of gun metal. Of an entirely new design. Can be used as Groover, Dado and Rabbet Plane, in any direction of the grain, and also as a Match Plane. COMMON SENSE DOOR SPRING.—The most durable and cheapest Door Spring yet made. LEAD PIPE CUTTERS.—To cut lead pipe in any position and without chips or burs. Please send for circulars and prices.

New York Wholesale Prices, March 13, 1878.

HARDWARE.

Anvils.
American ....℔ 15c—dis 20 %
Wright's ....℘ ℔ gold; 10½c over 250 ℔s 11c, gold
Armitage's Mouse Hole ....gold 10 @ 10½c
Wilkinson's ....℘ ℔ gold 11c
Eagle Anvils (American) ....℘ ℔ 9c dis 20 %

Augers and Bits.
Conn. Valley Mfg. Co.
Douglass Mfg. Co.
Ives
Beecher (French, Swift & Co)
Griswold
Nobles Mfg. Co.
Kasson's Patent } dis 50 @ %
Cook's, Douglass Mfg. Co ....dis 50&5 %
Cook's, Ives' ....dis 45&10 %
Snell Mfg. Co ....dis 30&10 %
Jennings' Bits ....dis 10&10 %
Ives' "Jennings" Bits ....dis 25 %
Lewis' Single Twist Bits ....dis 40 %
Andrews Bits ....dis 50 %
Griswold's Patent Bits ....dis 30 %
Expansive Bits, Clark's, small, $18; large, $26. dis 20 %
" " Ives ....$20 @ $30—dis 33⅓ %
" " Blake's ....$20—dis 40 %
" " Parmelee's ....small, $20; large, $36 ....dis 25 %
Hollow Augers Ives' / French Swift & Co ....} dis 40 %
" " Bonney's Adjust., ℘ doz $48—dis 25&10 %
" " Stearns' Adjust., ℘ doz $48—dis 25&10 %
" " Ives' Expansive ...each $4.50—dis 40 %
" " Univ'sal Expansive, each $4.50—dis 20 %
Gimlet Bits ....$7.50 ℘ gross, dis 40 %
" Diamond ....℘ doz $1.00 dis 25 %
" "Bee" ....dis 25&10 %
Double Cut Gimlet Bits Shepardson's ....dis 40 %
" " Ct. Valley Mfg. Co...dis 30&10 %
" " Hartwell's ....dis 50&10 %
" " Douglass' ....dis 40&10 %
" " Ives' ....dis 40&10 %
Morse's Bit Stock Drill, List of Jan. 1, '76 ....dis 25 %
L'Hommedieu's Ship Augers ....dis 15 %
Watrous Ship Augers ....dis 15 %

Awl Hafts.
Sewing, Brass Ferrule ....$3.50 ℘ gross—dis 35&10 %
Peg, " ....3.50 " dis 35&10 %
Patent Sewing, Short ....$1.00 ℘ doz—dis 35&10 %
" " Long ....$1.40 ℘ doz—dis 10 %
" Peg, Plain Top ....$10.00 ℘ gross—dis 35&10 %
" " Leather Top ....12.00 " dis 35&10 %

Awls, Brad Sets, &c.
Awls Sewing, Common ....℘ gross $1.35—dis 25 %
" Sewing, Best ....℘ gross 1.40—dis 10 %
" Shouldered Peg ....℘ gross 2.25—dis 15 %
" Patent Peg ....℘ gross .60—dis 15 %
" Shouldered Brad ....℘ gross $2.70—dis 25&10 %
" Handled Brad ....$8.00 ℘ gross—dis 35&10 %
" Handled Scratch ....$7.50 ℘ gross—dis 25&10 %
" Socket Scratch ....$1.00@$1.25 ℘ doz—net
Brad Sets, Aiken's ....℘ doz $12.00—dis 40&10 %
" No. 42, $10.50; No. 43, $12.50 ....dis 60 %
" Stanley's Excelsior. No. 1, $11.00—dis 25&10 %

Axles.
Common (Guy C. Hotchkiss, Field & Co.) ....℘ ℔ 4c
Solid Collar, Case Hardened, Chilled Box ....℘ ℔ 7½c
Axle Grease.—Fraser's ....℘ ℔ 6c

Balances.
Light or "Common" ....dis 25&10 %
All other Spring Balances ....dis 25 %
Bed Keys.—Gray's Ratchet ....℘ doz $4.00, dis 15 %

Bells.
Hand, Light Brass ....dis. 75 %
" Extra Heavy ....dis 40&5&10 %
" White Metal ....dis 60&5 %
" Silver Chime ....dis 20&10 %
" Swiss ....dis 25 %
" Globe (Cone's Patent) ....dis 20&10 %
Gong, Abbe's ....dis 20&10 %
" Yankee ....dis 35&10 %
" Barton's ....dis 40&2 %
Crank, Taylor's ....dis 25&10 %
" Brook's ....dis 50 %
" Cone's ....dis 10 %
" Connel's ....dis 50&10 %
Lever, Sargent's ....dis 65&10 %
" Taylor's Bronze or Plated Lever ....net
" Japanned Lever ....dis 25&10 %
" Hart, Bilven & Mead Mfg. Co ....dis 50&10&2 %
Pull, " " " " ....dis 50&10&2 %
" Brook's ....dis 50 %
" Western ....dis 25&10 %
Call ....dis 20 %
Cow, Common Wrought ....dis 20&10 %
" Western ....dis 20&10 %
" " Sargent's ....dis 60&10 %
" Kentucky "Star" ....dis 20&10 %
" " Sargent's ....dis 60&10 %
" Dodge's Genuine Kentucky, new list—
Nos. 0 1 1½ 2 3 4 5 6 Hog
$12.00 10.00 9.00 8.00 6.00 5.00 3.50 2.50 5.00, dis 50 %
" Yaw's Genuine ....dis 50 %
" Texas ....dis 40 %

Bellows.
Blacksmiths', Common ....dis 30 %
" Extra and Pittsburgh Pattern ....dis 20 %
Moulders' ....dis 25 %
Hand Bellows ....dis 20 %
Blind Adjusters.—Domestic ....℘ doz $3.00, dis 20 %
Blind Fasteners.—Mackrell's ....dis 30 %
Van Sand's ....No. 2000, $14.00, dis 25&10 %
" old pattern ....℘ gross, $10.50, dis 5@10 %
Washburn's Patent ....℘ gross $14.00, dis 30 %
Merriman's ....new list net
Blind Staples.
Boardman's Patent, ⅜ in. and larger ℘ ℔ 41c. dis 10&5 %
" 5/16 in ....℘ ℔ 46c. dis 10&5 %
Harvey's Patent ....⅜ & 5/16 in. ℘ ℔ 41c., dis 10&5 %
" ¼ in ....℘ ℔ 46c., dis 10&5
Blocks.—Burr & Co ....dis 25 %
Differential Pulley Blocks ....dis 20 %
Tackle, Rope and Iron Strapped, Providence Tool Co.'s list ....dis 40 %
Stanley Rule and Level Co ....dis 33⅓&10 %
Blowers.
Keystone Portable Forge Co ....dis 20 %

Bolts.
Cast Iron Barrel, Shutter, &c ....dis 65&10 %
Cast Iron Chain (Sargent's list) ....dis 65&10 %
Bush's Lever Bolts ....dis 40, 10&10 %
Spring Butts (Humason & Beckley Mfg. Co.) dis 40&10 %
Wrought Iron Barrel ....dis 50, 10&10 %
" " Square ....dis 50, 10&10 %
" " Shutter (Stanley's list) ....dis 50 %
" " " (Sargent's new list).dis 50, 10&10 %
" " Sunk Flush, Sargent's ....dis 50&10&10 %
" " " " Stanley's ....dis 15&10 %
" " B.K.Flush, Comm'n, Stanley's.dis 30&10 %
" " " " Ex. Heavy ....dis 20&10 %
" " Plated Knob & Slide Flush " dis 10&10 %
Carriage and Tire, Common ....dis 75&3 % cash
" " Norway Iron ....dis 70 %
" " R. B. & W...(old list) dis 70&5 % cash
" " Philadelphia ....dis 70 %
" " Coleman ....dis 60&10 @ 60&20 %
" " Shelton's ....(old list) dis 65&5 %
Tire, Am. Screw Co ....dis 70&10 %
" "Bay State" ....dis 75&15 %
Star (Phila) ....dis 60&10@60&20 %
Union Nut Company ....dis 70 %
Stove—American Screw Co.'s ....dis 55 %
" R. B. & W ....dis 50&10 %
" Union Nut Co ....dis 50 %
Plow ....dis 50 %
Machine ....dis 65&10 %
Bolt Ends ....dis 60
Bolt and Rivet Clippers—Chambers ....dis 25&15 %
Borax ....12 @ 12½c ℘
Boring Machines. Upright. Angular.
First quality, no Augers ....$5.50 $7.50 dis 40&10 %
" with Augers ....9.00 11.00 dis 40&10 %
Second quality, no Augers ....2.35 3.00 net
" with Augers 4.00 4.65 net
Snell's, no Augers ....4.75 6.25 dis 25 %
Phillips' with Augers ....10.00 dis 25 %

Bow Pins.
Union Nut Co ....dis 60&10 %
Hotchkiss' ....low list dis 10 %
Humason, Beckley & Co.'s ....dis 60 %
Sargent & Co.'s ....$19.70 and $21.40, dis 60&10 %
Braces.—Barber's Patent ....dis 40&5 %
O. S. Backus ....dis 50&10 %
Wilson Mfg. Co ....dis 10 %
Spofford's Patent ....dis 50 %
Noble's Patent ....dis 40&5 %
Ives' "Centennial" ....dis 50 %
Common Ball (American) ....dis 25&10 %
Brackets.—Shelf (Sargent's) ..dis 60&10 @ 60&10&10 %
Swing (T. & S. Mfg. Co.) ....dis 33⅓ %
Bright Wire Goods ....dis 75&10 %
Bull Rings.—Union Nut Co ....dis 50&20 %
Sargent's ....dis 66⅔&10 %
Hotchkiss' ....low list dis 10 %
Humason, Beckley & Co.'s ....dis 60 %
Union Nut Co ....dis 60&10 %

Butts.
Wrought Brass ....dis 75 %
Cast Brass ....dis 30 @ 40 %

COMMON CAST, NOT DRILLED.

Fast Joint, Narrow ....dis 60&10 %
" Broad ....dis 65&10 %
Loose Joint, Narrow and Broad ....dis 70&10 %
Parliament Butts ....dis 65&10 %
Mayer's Hinges ....dis 70&10 %

DRILLED AND WIRED.

Fast Joint, Narrow ....dis 50&10 %
" Broad ....dis 55&10 %
" Broad, Japanned ....dis 35&10 %
Loose Joint ....dis 66⅔&10 %
" Japanned ....dis 62½&10 %
" with Acorns ....dis 65&10 %
Parliament Butts ....dis 60&10 %
Mayer's Hinges ....dis 65&10 %
Loose Pin, no Acorn ....dis 66⅔&10 %
" Acorns ....dis 66⅔&10 %
" " Japanned ....dis 70&10 %
" " " Plated Tips ....dis 60&10 %
Union Mfg. Co.'s Fancy Butts—
Figured Enameled Loose Joint ....dis 60&10 %
Boston Finish, Plain ....dis 80&10 %
" " with Iron Acorns ....dis 75&10 %
" " with Silvered Acorns ....dis 60&10 %

WROUGHT IRON.

Fast Joint Narrow ....dis 40&10 %
Lt. Narrow ....dis 30&10 %
Broad ....dis 40&10 %
Loose Joint. Broad ....dis 40&10 %
Tab (Butts, Back Flaps, &c ....dis 35&10 %
Inside Blind, Regular ....dis 35&10 %
" Light ....dis 40&10 %

Loose Pin, Wrt ....dis 40&10 %
Am. Spiral Spring Butt Co., Japanned ....dis 25 %
" " " Fancy ....dis 10 %
Sabin Mfg. Co., Double Acting ....dis 35 %
Union Spring Hinge Co ....dis 25 %
" Mfg. Co. Spring Hinges ....dis 25 %
Blind Butts, Parker ....dis 70 %
" Palmer ....dis 40&10 %
" Seymour ....dis 60&10 %
" Shepard ....dis 60 %
" Lull & Porter ....dis 66⅔&10 %
" Nicholson ....dis 45&10 %
" Huffer ....dis 40&10 %
" Garretson ....dis 60 %
" Clark's, Nos. 1, 3, 5, 40 and 50 ....dis 70 %
" Sargent's ....dis 70&5&10 %

Butchers' Cleavers.
Humason & Beckley Mfg. Co ....dis 20 %
D. R. Barton Tool Co ....dis 20 %
Bradley's ....dis 25 %
Beatty's ....dis 25 %
1 2 3 4 5 6 7 8
$16.50 19.00 21.50 24.00 27.00 30.00 33.50 36.50
Hart Mfg. Co ....dis 50&10 %
0 1 2 3 4 5 6
$20.00 26.00 29.50 33.00 37.00 41.00 45.00

Can Openers.
Messenger's Comet ....℘ doz $3.00, dis 20 %
American ....℘ doz $2.25, dis 50&10 %
Lyman's ....℘ doz $3.75, dis 20 %
Poole ....℘ doz $3.75, dis 40 %
No. 4, French ....℘ doz $2.25, dis 50 %
No. 5, Iron Handle ....℘ doz $2.25, dis 50&10 %
Sprague's ....Nos. 1 2 3
℘ doz $2.00 2.25 2.50 dis 33⅓ %
Eureka ....℘ doz $2.50, dis 10 %
Sardine Scissors ....℘ doz $7.00, dis 40 @ 40&5 %
Star ....℘ doz $5.00, dis 25 %
Caps—Percussion, ℘ 1000.
Hicks & Goldmark's G. D. & S. R ....36 @ 38c
" " E. B. 1-10 Ground ....70c, dis 5 %
" " E. B. 1-10 Turned ....65c, dis 5 %
" " D. W. P. 1-10 ....$1.40, dis 5 %
" " D. W. P. ¼ ....1.35, dis 5 %
" " Colt's 1-10 ....70c, dis 5 %
Ely's E. B ....1-10s, 65 @ 68c. gold
" Double Waterproof, 1-4s, $1.50; 1-10s, $1.58c, gold
Colt's ....1-10s, 80c, gold
Cartridges.—Metallic ....dis 60 %
Cards.—Horse and Curry ....dis 30&10 %
Cotton ....dis 10&10 %
Wool ....dis 15&10 %
Carpet Stretchers.
Cast Steel, Polished ....℘ doz $5.00, dis 30 %
" Iron, Steel Points ....℘ doz $2.00, dis 45&5 %
Casters.
Bed ....dis 55 %
Plate and Shallow Socket ....dis 55 %
Deep Socket ....dis 40 %
Cattle Leaders.
Hotchkiss' Sons' ....dis 10&10 %
Humason, Beckley & Co.'s ....dis 60 %
Sargent's ....dis 60&10&10 %
Union Nut Co ....dis 60&10 %
Chain.
Trace, 6½-1-2 ....by the cask, ℘ pair, gold, 45 @ 46c
" 6½-10-3 ....by the cask, ℘ pair, gold, 43 @ 44c
" 7-10-2 ....by the cask, ℘ pair, gold 49 @ 50c
German Halter Chain ....dis 30&5 % gold
" Coil ....dis 30&5 % gold
Galvanized Pump Chain ....℘ ℔ 10½c dis 10 %
Jack Chain, Iron ....dis 60 %
" Brass ....dis 50 %
Chalk.
White ....℘ gross 55c net
Red ....℘ gross 75c net
Blue ....℘ gross 90c net
White Crayons ....℘ gross 13½c net
Chisels.
D. R. Barton Tool Co. (all kinds) ....dis 20 %
Socket Framing, Crossman ....dis 65&10 %
" " Buck Bros ....new list, dis 25 %
" " Hart Mfg. Co ....dis 65&5&10&2 %
" " Merrill ....dis 60&10 %
" " Witherby Tool Co ....dis 60&10 %
" " Douglass' ....dis 70 %
" Firmers, Crossman ....dis 65&5 %
" " Buck Bros ....new list, dis 25 %
" " Hart Mfg. Co., extra..dis 65&5&10&2 %
" " Merrill ....dis 60&10 %
" " Witherby Tool Co ....dis 60&10 %
" " Douglass' ....dis 70 %
" Corner ....dis 65@70 %
Tanged Firmers extra ....dis 40 %
" " Butcher's ....$5.00 @ $5.25 to £ gold
" " Newbould's ....5.50 to £ gold
" " Spear & Jackson's ....5.00 to £ gold
" " Buck Bros (Shank) ....5.00 to £ gold
Clamps.
Iron, Providence Tool Co.'s, Wrt. Iron ....dis 25 %
" Adjustable, Gray's ....dis 20 %
" " Lambert's ....dis 20 %
" " Snow's ....dis 40&5 %
" " Hammer's ....dis 15 %
" " Stearns' ....dis 15&10 %
" Cabinet, Sargent's ....dis 60&10&10 %
" Carriage Makers', Sargent's ....dis 60&10&10 %
" Cord and Tape (T. & S. Mfg. Co.) ....dis 30 %
Clips, Axle.
Norway or Best ....dis 50 %
Superior ....dis 55 %
Cockeyes ....1¼ in., 28c.; 1⅜ inch, 33c.; 1⅝ in., 37c, net
Cocks.
Brass Racking ....dis 55 %
Lock and Globe ....dis 50@55 %
Lever Bibbs ....dis 50 %
Ale and Beer ....dis 40 @ 45 %
Coffee Mills.
Board and Box ....dis 20@25 %
Increase Wilson's ....dis 25 %
Selsor's Pat ....$9.50, $10.50, dis 25 %
American (Enterprise Mfg. Co.) ....dis 20 %
French Steel ....dis 20 %
The Swift (Lane Bros.) ....dis 25 %
Compasses, Dividers, &c.
Compasses ....dis 35&10 %
Callipers ....dis 30&10 %
Dividers ....dis 45&10 %
Bemis & Call Co.'s Compasses and Dividers ..dis 35&10 %
Cook's ....dis 15 %
Excelsior ....dis 50 %
Miller's Patent ....dis 25 %
Coopers' Tools.
Bradley's ....dis 15 @ 20 %
Chas. E. Little ....dis 20 @ 25 %
D. R. Barton Tool Co ....dis 20 %
Corkscrews.—Humason & B ....dis 33⅓ %
Corn Knives and Cutters.—Bradley's ....dis 10
Crow Bars.
Cast Steel ....℘ ℔ 9c net
Iron, Steel Points ....℘ ℔ 5c
Crucibles.—Gautier & Co ....℘ No. 5½c
Curling Irons, &c.
⅜, ⅝, ¾ in.. $1.80, 2.00, 2.40 ....dis 10 %
Curling Tongs ....℘ doz $6.50, dis 15 %
Pinching Irons ....℘ doz 7.50, dis 20 %
Curry Combs.
Curry Comb Mfg. Co ....dis 25&10 %
Fitch's (List of No. 240, $1) ....dis 30&10 %
Hotchkiss' & Kellogg's, Iron & Brass, old list.dis 40&7½ %
Hotchkiss' Novelty ....dis 25 %
Rubber ....℘ doz $9.00. dis 15 %
Curtain Pins.—Silvered Glass ....new list, dis 15 %
White Enamel ....dis 40 %
Cutlery.
Meriden Cutlery Co. (Table) ....net
Am. Miller Bro.'s Cutlery Co ....dis 25 %
Humason & Beckley, Pocket ....dis 25 %
Naugatuck Cutlery Co ....list net
New York Knife Co. (Pocket) ....dis 35&5 % cash
" " (Table) ....net

Dippers.
Britannia ....℘ doz $3.75 @ $4.25, net
Cocoa, Plain ....℘ doz $3.25, dis 20 %
" Rimmed ....℘ doz 3.75, dis 20 %
Dog Collars.
Embossed Gilt ....dis 20 %
Leather ....dis 30 %
Brass ....dis 25 %
Door Springs.
Torrey's Rod ....℘ doz $2.00 net
Gray's " ....℘ doz $2.00, net
Johnson's Rod ....℘ doz 5.00, net
Gem (Coil)—
No. 1, Large, Japanned ....℘ doz $3.50
No. 2, Medium, " ....℘ doz 2.50 } dis 10 %
No. 3, Small, " ....℘ doz 2.00
Challenge (Coil)— Nos. 9 7 6
Japanned ....℘ doz $2.00 2.50 3.50
Coppered ....℘ doz 4.00 4.50 5.00 } dis 15 %
Galvanized ....℘ doz 3.50 4.00 4.50
Nickeled ....℘ doz 5.50 6.00 7.00
Premium (Coil)— Nos. 1 2 3
Japanned ....℘ doz $7.50 6.25 5.00 } dis 30 %
Nickeled ....℔ doz 11.00 9.50 8.00
Star (Coil)—For Cop'd, Nickel-Plated, &c., see list.
No. 5, Small ....℘ doz $2.00
No. 6, Medium ....℘ doz 2.50 } dis 15 %
No. 7, Large ....℘ doz 3.50
Philadelphia ....5 in., $5.00; 8 in., $7.00, dis 35 %
Barker's Concealed ....dis 20 %
Cowell's ....No. 1, $18.00; No. 2, $15.00 ℘ doz, dis 50 %
Drawing Knives.
Crossman's No. 1 ....dis 65&10 %
D. R. Barton Tool Co ....dis 20 %
Hart Mfg. Co., extra ....dis 65&5&10&2 %
Merrill ....dis 60&10 %
Nobles Mfg. Co ....dis 15 %
Bradley's ....dis 35 %
Adjustable Handle ....dis 20 %
Witherby Tool Co ....dis 60&10 %
Douglass' ....dis 70 %
Drills and Drill Stocks.
Blacksmiths' ....each $2.15 net
" Self-Feeding ....each $7.50, dis 10 %
Breast, P. S. & W ....dis 25 %
" Hotchkiss ....dis 10 %
" Wilson's ....dis 20 %
" Miller's Falls ....each $2.50, dis 25 %
Ratchet, Merrill's ....dis 20 %
" Ingersoll's (old list) ....dis 35 %
" Whitney's ....dis 20 %
" Weston's ....dis 20 %
" Moore's Triple Action ....dis 20 @ 25 %
Whitney's Hand Drill ....dis 20&10 %
Wilson's Drill Stocks ....dis 10 %
Automatic Boring Tools ....each $2.75, dis 20 %
Drill Chucks.—Danbury ....each $8.00, dis 30 %
Morse's Beach Patent ....dis 30 %
" Adjustable ....each $10.00, dis 30 %

Egg Beaters.
Dover ....℘ doz $5.00, dis 20 %
Family ....℘ doz $3.00 net

National ....℘ doz $4.50, dis 33⅓ %
Schofield ....℘ doz $3.50
Elevator Buckets.
Mill E. Buckets, light, 5 to 10 inches, (Duc's Improved) ℘ 100 $23.00 @ $54.00, net
Mill E. Buckets, heavy, 5 to 10 inches (Duc's Improved) ℘ doz $5.60 @ $10.20, net
Emery.
Genuine Chester—Regular Nos ....℘ ℔ 6c } dis 10 %
" " Flour and FF ....℘ ℔ 4c
Washington Mills—Regular Nos ....℘ ℔ 8c
" Flour ....℘ ℔ 5c
Wellington Mills, Grain ....℘ ℔ 10c net
" " Flour ....℘ ℔ 8c net
Hampden Emery Grain ....5c net
" " Flour ....3c net
Enameled and Tinned Ware.
Kettles ....dis 40 @ 50 %
Sauce Pans ....dis 30 @ 35 %
Glue Kettles ....dis 40 %
Tinned Sauce Pans ....dis 30 @ 35 %
Escutcheons.
Door Lock ....Same discounts as Door Locks
Brass Thread ....dis 60&10 %
Wood ....dis 25 %

Faucets.
Fenn's ....dis 50 %
Fenn's Cork Stops ....dis 40 %
Star ....dis 55&10 %
Frary's Patent Petroleum ....dis 20&10 %
Wood and Metallic, High list ....dis 40 %
" Cork Lined ....dis 65&10 %
Enterprise Mfg. Co., Self-Measuring ....dis 20 %
Felloe Plates ....℘ ℔ 15c, dis 50 %
Files.
American File Co ....$5.00 to £ currency, dis 30 %
Auburn ....$5.00 to £ currency, dis 25 %
Arcade ....$5.00 to £ currency, dis 30 %
G. & H. Barnett ....dis 25 %
Nicholson ....(Nicholson List) dis 35 %
Heller & Bros ....$5.00 to £ currency, dis 15 @ 20 %
Madden & Cockayne File Co ....$5.00 to £ cur., dis 25 %
Jowitt's ....$4.50 to £ gold
J. & Riley Carr ....4.50 to £ gold
Stubs' ....$7.00 @ 7.50 to £ gold
Butcher's ....4.50 to £ gold
Walter Spencer & Co.'s "Diamond" ....4.50 to £ gold
Fisher's ....4.75 to £ gold
Moss & Gamble ....4.50 to £ gold
Thos. Turner & Co. (Peter A Frasse & Co.). 4.50 to £ gold
" " Horse Rasps ....4.75 to £ gold
H. Disston & Sons (new list) ....dis 35 %
Limet & Co. (French) ....$4.25 to £ gold
Boynton's Cant ....dis 40 %
Fluting Machines.
Knox, 4-inch Rolls ....$2.10 each net
" 6 " " ....$2.50 each net
" 8 " " ....4.40 each net
Peerless, 4-inch Rolls ....4.00 each net
" 5 " " ....4.75 each net
Improved Knox (Climax), 4-inch ....2.65 each net
" " " 6 " ....3.15 each net
" " " 8 " ....4.90 each net
Eagle, 3½-inch Roll ....$18.00 ℘ doz, dis 10 %
" 5½ " " ....24.00 ℘ doz, dis 10 %
Empire ....$4.00 each net
Eureka, No. 1, 7-inch Roll ....6.75 each net
" No. 2, 5-inch Roll ....5.00 each net
Crown. 4½-in. Roll, $2.10; 6-in., $2.50; 8-in., $3.85 each, net
Domestic Fluter ....1.50 each net
Geneva Hand Fluter ....$15.00 ℘ doz, dis 5 @ 10 %
Combined Fluter and Sad Iron ....℘ doz 15.00, dis 10 %
Fluting Scissors ....dis 40&10 %
Forges.
"Empire" ....dis 20 %
Keystone Portable Forge Co ....dis 20 %
Forks.
Hay, Manure and Spading ....new list, dis 15 %
Plated A 1 ....dis 40&5 %
" Reed & Barton ....dis 40&5 %
Fruit and Jelly Presses.
Enterprise Mfg. Co ....dis 20 %
Fry Pans.
Burnished, P. S. & W., new list ....dis 60 %
No 0 1 2 3 4 5 6 7 8
℘ doz ..$3.00 $3.75 4.25 4.75 5.25 6.00 7.00 8.00 9.00

Gauges.
Marking ....dis 45&10 %
" Star ....dis 35 %
Wire ....dis 10 %
" Smith's Patent ....℘ doz $18.00, dis 40 %
Gimlets.
Nail and Spike ....dis 40@45 %
"Bee" Gimlets ....℘ gross $12.00, dis 45 %
"Eureka" Gimlets ....dis 40 %
Double Cut, Shepardson's ....dis 30 %
" " Hartwell's ....dis 50 %
" " Ives' ....dis 40&10 %
" " Douglass' ....dis 40&10 %
Glue Pots.
Tinned and Enameled ....dis 40 %
Family, Howe's "Eureka" ....dis 25 %
" L. F. & C.'s "Handy" ....dis 25 %
Grindstone Fixtures.
Sargent's Patent ....dis 70&10&10 %
Reading Hardware Co ....dis 40&10 %
" " " "Keystone" ....dis 45&10 %
Hart Mfg. Co., Nos 9 to 11 ....dis 75&7½&10 %
Rick Bros ....dis 45&5 %

Hammers.
Maydole's (new list on A. E. Bell Face) ....dis 15 %
Hammonds' (new list) ....dis 15&5 %
Humason & Beckley Mfg. Co ....dis 33⅓ %
Cheney's Steel Face and Claw ....dis 10 %
" all Steel ....dis 20&10 %
Verree ....dis 5 %
Magnetic Tack ....dis 25&10 %
Warner & Noble's ....dis 10 %
Hand Cuffs and Leg Irons.
Providence Tool Co.'s Hand Cuffs, $15.00 ℘ doz } dis 10 %
" " Leg Irons, $25 ℘ doz
Handles.
Door or Thumb Latches—
Nos 0 1 2 3 4
Per doz ....$0.80 1.00 1.18 1.35 1.50 ....dis 65&10 %
Roggin's Latches ....33c net
Bronzed Iron Drop Latches ....℘ doz $0.85 @ $1.00 net
Jap'd Store Door Handles—Nuts, $1.40; Plate $0.95
no Plate, 75c ....net
Barn Door ....per doz $5.00, dis 65&10&10 %
Wrought Chest ....dis 60&10 %
Surface Chest, Sargent's list ....dis 60&10&10 %
Flush Chest ....dis 60&10&10 %
Lifting ....dis 60&10 %
Saw and Plane ....dis 35&10 %
Boynton's X Cut (Loop) ....dis 20 %
" " (Centennial) ....dis 15 %
Hammer and Hatchet ....dis 20 %
North Carolina Handle Co ....dis 20 %
Brad Awl ....℘ gross $3.75, dis 25&10 %
Hickory Firmer Chisel, assorted, ℘ gross $5.25
" " " large, " 6.50
Apple " " assorted, " 6.00
" " " large, " 7.50
Socket " " assorted, " 4.50 } dis 40 %
" Framing " assorted, " 7.00
File, assorted, ℘ gross 3.50
Auger, assorted, ℘ gross 6.00
" large, " 7.00
Patent Auger, Ives' ....dis 25&10 %
" Douglass' ....℘ set $1.25, dis 10 %
" Swan's ....℘ set $1, dis 20&10 %
Hangers.
Barn Door ....dis 70&10 @ 70&10&10 %
Novelty ....dis 40 %
Challenge ....dis 50 %
Climax (Anti-Friction) ....dis 50 %
Sterling Improved (Anti-Friction) ....dis 70&10 %
Harness Snaps.
Henshaw's ....List of 1½ changed to $14.00, dis 50 %
Judd's ....14.00, dis 50 %
Fitch's (Bristol) ....14.00, dis 50 %
Hotchkiss' ....dis 10 %
Andrews' ....dis 45 %
Sargent's ....dis 60&10 %
New York Wire ....dis 20&20 %
"German" ....dis 60 %
Hatchets.
Isaiah Blood ....dis 15 %
Shingling, Nos. 1 2 3 ....℘ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3 ....℘ doz 7.75 8.50 9.25
Lathing, Nos. 1 2 3 ....℘ doz 7.50 8.00 8.50
Hunt's ....dis 25 %
Shingling, Nos. 1 2 3 ....℘ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3 ....℘ doz 7.75 8.50 9.25
Lathing, Nos. 1 2 3 ....℘ doz 7.50 8.25 9.00
Hurd's ....dis 30&10 %
Shingling, Nos. 1 2 3 ....℘ doz $8.00 $8.50 $9.00
Claw, Nos. 1 2 3 ....℘ doz 9.00 9.50 10.00
Lathing, Nos. 1 2 3 ....℘ doz 8.00 8.50 9.00
Simmon's ....dis 35 %
Shingling, Nos. 0 1 2 3 ....℘ doz $7.50 $8.00 $8.50 $9.00
Claw, Nos. 1 2 3 ....℘ doz 9.00 9.50 10.00
Lathing, Nos. 1 2 3 ....℘ doz 8.00 8.50 9.00
Broad, Nos. 1 2 3 4 ....℘ doz 9.00 10.00 12.00 14.00
" Nos. 5 6 7 8 ....℘ doz 16.00 18.00 20.00 22.00
Collins' ....dis 10 %
Shingling, Nos. 1 2 3 ....℘ doz $6.00 $6.50 $7.00
Claw Nos. 1 2 3 ....℘ doz 6.50 7.00 7.50
Lathing, Nos. 1 2 3 ....℘ doz 6.00 6.50 7.00
D. R. Barton Tool Co ....dis 20 %
Shingling, Nos. 1 2 3 ....℘ doz $11.00 $10.50 $10.00
Lath, Nos. 1 2 3 ....℘ doz 10.50 10.00 9.50
Half Hatchets. Nos. 1 2 3 ....℘ doz 11.00 10.50 10.00
J. P. Verree & Co ....dis 5 %
Shingling, Nos. 1 2 3 ....℘ doz $7.00 $7.50 $8.00
Claw, Nos. 1 2 3 ....℘ doz 7.50 8.00 8.50
Lathing, Nos. 1 2 3 ....℘ doz 7.00 7.50 8.00
Underhill's ....dis 20 %
Shingling, Nos. 1 2 3 ....℘ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3 ....℘ doz 7.75 8.50 9.25
Lathing, Nos. 1 2 3 ....℘ doz 12.00 11.00 13.00
M. H. Jones & Co ....dis 40 %
Shingling, Nos. 1 2 3 ....℘ doz $8.00 $8.50 $9.00
Half Hatchets, Nos. 1 2 3 ....℘ doz 8.00 8.50 9.00
Claw, Nos. 1 2 3 ....℘ doz 9.00 9.50 10.00
Lathing, Nos. 1 2 3 ....℘ doz 8.00 8.50 9.00
Broad, Nos. 2 3 4 ....℘ doz 11.00 13.00 14.50
" Nos. 5 6 7 ....℘ doz 16.50 18.00 19.50
Hay Knives.
"Lightning" ....℘ doz $20.00 net
Wadsworth's ....dis 30 %
Hinges.
Gate, Western ....℘ doz $6.25, dis 60&10 %
" N. E ....℘ doz $10.13, dis 60&5&10 %
" N. E. Reversible ....℘ doz $6.50, dis 60&10 %
" N. Y. State ....℘ doz $7.20, dis 60&10 %
" Clark's No. 1 ....℘ doz $6.00, dis 50 %
" Automatic ....℘ doz $12.50 dis 20&10 %
Rolled Blind Hinges ....dis 60&10 %
Rolled Plate ....dis 60&10 %
Rolled Raised ....dis 60&10 %

Wrought Strap and T, list Dec. 20, '77 ....dis 60&12½ %
Providence Plate { 6 to 10 in. 11c ℘ ℔ / over 10 in. 9½c ℘ ℔ } ..dis 40&10 %
Screw Hook and Strap ....{ 8, 10, 12 in., 11c / 14 to 36 in., 9½c } dis 40&10 %
Heavy Welded Hook ....{ 8 to 12 in., 11 c / 14 in. & up, 9½c } ..dis 30 %
Screw Hook and Eye ....{ ¾ to 1 in., 11 c / ⅝ in. 12½c / ½ in. 13 c } ....net
Hoes.
Solid Shank, C. S ....℘ doz $5.25, dis 15 %
Socket ....℘ doz 5.75, dis 15 %
Riveted Eye ....℘ doz
Grub ....dis 30 %
Planters' ....dis 35 @ 40 %
Scovill Pattern ....dis 25 @ 30 %
Handled Solid C. S. Shank ....dis 35 %
Planters', Handled ....dis 35 %
Scovill Pattern, Handled ....dis 35 %
Hick's Pat. Solid C. S. Planters' ....dis 20&10 @ 30 %
" " " Scovill Pattern ....dis 20&5 @ 25 %
Hooks.
Bird Cage, Sargent's list ....dis 60&10&10 %
Cotton ....dis 50 %
Cotton (Humason & Beckley Mfg. Co.) ....dis 25 %
Belt ....dis 70 %
Bench—Hotchkiss', $5.00 ℘ doz ....dis 10 %
" Weston's, No. 1, $10.00; No. 2, $9.00 ℘ doz dis 25 %
" McGill's, $3.00 ℘ doz ....dis 10 %
" Skinner's, $6.25 per doz ....dis 20 %
Clothes Line, Hart's list ....dis 60&10&5&10 %
" Sargent's list ....dis 66⅔&10 %
" Reading list ....dis 33⅓&5&10 %
Ceiling.. { Hart's list ....dis 70&10 %
Harness. { Sargent's list ....dis 70&10 %
{ Reading list ....dis 45&10 %
Coat and Hat, Hart's list ....dis 65&5&10 %
" " Sargent's list ....dis 66⅔&10 %
" " Reading ....dis 45&10 %
" " T. & S. Mfg. Co's list ....dis 25 %
Tassel (T. & S. Mfg. Co.) ....dis 40 %
Wrought Staples and Hooks and Staples ....dis 75 %
" Staples, Stanley's list ....dis 40 %
Wire Screw Hooks and Eyes ....dis 75&10 %
Grass ....dis 30&10 %
Whiffletree—Patent ....dis 40@45 %
Hooks and Eyes—Malleable Iron ....dis 60&10&10 %
" " Brass ....dis 60&10&10 %
Horse Nails.
Nos. 5 6 7 8 9 10
Ausable ....℘ ℔ 30c 27c 25c 24c 23c 22c
" Finished, Polished or Blued ... " 31c 28c 26c 25c 24c 23c } dis 20 %
Nos. 5 6 7 8 9 10
Cortland ....29c 26c 24c 23c 22c 21c } dis 15
" P't'd & Blued. 31c 28c 26c 25c 24c 23c } @ 25 %
Globe (New list).. { Nos. 5 6 7 8 9 10
26 23 21 20 19 18c net
North Western Fini'h'd 26 23 21 20 19 18c net
" " Plain 25 22 20 19 18 17c net
National. Pointed and Polished, Pat. Fin ....25 23 22 21 20c net
Putnam Hammer, P't'd 26 23 21 20 19 18c net
Vulcan P't'd & Blued.. 26 23 21 20 19 18c net
Horse Shoes.—Burden ....℘ keg $4.02½
R. I. Horse Shoe Co., Perkins' Improved Light, Medium and Heavy ....℘ keg 4.02½
Mule Shoes ....℘ keg 5.02½
Perkins' Snow ....℘ keg 5.02½
The Boston Horse Shoe ....℘ keg 5.00

Ice Awls, Chisels, &c.
American Ice Chisel ....℘ doz $6.50 net
National " ....℘ doz $6.50, dis 10 %
Novelty Ice Breakers ....℘ doz $6.50 net
White's Sliding Head Picks ....℘ doz $2.50 dis 20 %
Dunlap's Ring Picks ....℘ doz 3.00, dis 20 %
Wood Head Picks, Sargent's ....℘ doz $1.85, dis 60&10 %
Iron " ....℘ doz 1.85, dis 60&10 %
Ice Mallets, Pickin Head ....℘ doz $1.75 net
" Pick in Handle ....℘ doz 3.00 net
Ice Axes, Small Cast or Malleable ....℘ doz 1.50 net
Kitchen Ice Tongs ....℘ doz 2.25 net

Kettles.
Brass, 7 to 13 inches inclusive ....℘ ℔ 35c net
Brass, larger than 13 inches ....℘ ℔ 40c net
Enameled ....dis 55 %
Knives.
Ames' Butcher Knives ....dis 20 %
" Shoe ....dis 15 %
" Bread ....℘ doz $1.50, dis 15 %
Hay and Straw—"Wadsworth's" ....dis 30 %
Table and Pocket ....See Cutlery
Knobs.
Carriage (Jap'd 80c. ℘ gross) ....dis 60&10 %
Base—Common ....dis 30&10 %
" Plush Tip ....dis 10 %
" Elastic End. No. 8 ....dis 60&10 %
Door, Mineral ....
" Por. Jap'd ....
" " Plated .... } Same discounts as Door Locks.
" " Por ....
Furniture, Plain ....75c gross inch, dis 10 %
" Wood Screws ....dis 20 %
Picture (T. & S. Mfg. Co.) ....dis 50 %

Ladles.
Melting—Hart's ....dis 55&10 %
" Sargent's ....dis 50&10 %
" Reading ....dis 15&10 %
" Monroe's Patent ....℘ doz $4.00, dis 20 %
Lanterns.
Tubular ....No. 0, $10.00; No. 1, $12.50 } net
With Guards, 50c extra.
Hurricane ....dis 25 %
Peerless ....No 5, ℘ doz $11.75, dis 10&10 %
Brady's Patent ....dis 10&10 %
Ætna ....dis 10&10 %
Yankee ....dis 10&10 %
De Beque ....dis 10&10 %
Police. Small, $7.50; Med., $9.00; Large, $12.00, dis 15@20 %
Lard Presses.
Draw Cut, 14 inch ....each $65.00, dis 20 %
Enterprise Mfg. Co ....dis 20 %
Lemon Squeezers.
Porcelain Lined ....℘ doz $4.00 net
Eureka, Tinned ....℘ doz $10.00, dis 10 %
Dunlap's Improved ....℘ doz $4.00 net
Sammis' Patent ....No. 1, $7.50; No. 2, $12.00 ℘ doz ....dis 25&10 %
Lines.—Linen Fish ....dis 25 %
Cotton Chalk ....dis 50 %
Sil. Lake Chalk ....Nos. 0, 1, 2, 3, $6.00, $6.50, $7.00, $7.50 ....dis 20 %
Mason's Linen ....dis 20 %
Wire Clothes, Gal d ....each 35 @ 45c net
Locks and Latches.
Cabinet—Gaylord }
" Eagle.. } ....dis 25&2 %
" Barnes & Deitz ....dis 30 %
" Bridgeport Lock Co ....dis 25&2 %
Trunk ....dis 25 %
Langstroth & Crane's List Jan. 1, '77.
Round Key ....dis 40&10 %
Flat Key ....dis 33⅓&10 %
Barnes & Deitz, Flat Key ....dis 30 %
Yale Lock Co., Flat Key ....dis 40 %
Shepardson's, Flat Key ....dis 35 %
American Lock Mfg. Co ....dis 33⅓ %
Plate ....dis 33⅓&5&2 %

DOOR LOCKS, &C.

Branford ....dis 60&10&2 %
Norwalk ....dis 50&10&2 %
Norwich ....dis 50&10&2 %
Russell & Erwin ....dis 60&10&2 %
Mallory, Wheeler & Co ....dis 35&10&2 %
Padlocks—Russell & Erwin ....} ....dis 33⅓&5 %
" Mallory, Wheeler & Co ....} and 2 % for cash
" Wm. Wilcox & Co ....}
" American Lock Mfg. Co ....dis 33⅓ %
" Romer's ....dis 20 %
" Vulcan Hardware Co ....dis 20 %
" New York Lock Co ....dis 20 %
" J. H. McWilliams ....dis 10 %
" Barnes & Dietz ....dis 30 %
" Miller's Patent ....dis 50 %
" Penn Lock Works ....dis 33⅓ %
" " " (Scandinavian) ....dis 50 %

Mallets.—Hickory and Lignumvitæ ....dis 10&10 %
Meat Cutters.
Dixon's (P. S. & W.) Nos. 1 2 3 4
℘ doz ..$14.00 17.00 19.00 30.00—dis 25 %
Miles' Challenge ....Nos. 1 2 3
℘ doz ..$22.00 30.00 40.00—dis 30 %
Perry's Nos. 1 2 3 4 4 g'rd 5 g'rd
Each ..$3.00 4.00 5.00 11.00 13.00 $5.00—dis 20&10 %
Woodruff's (P. S. & W.) ....Nos. 100 150
℘ doz ..$15.00 18.00—dis 20&10 %
Hales' ....Nos. 11 12 13
℘ doz ..$33.00 40.00 51.00—dis 50&5 %
Draw Cut ....Nos. 5 2 6 8 10
Each ..$50.00 75.00 80.00 225.00 400.00—dis 20 %
American ....dis 25 %
Nos ....1 2 3 4 B 5
Each $5.00 7.00 10.00 25.00 50.00 60.00
Molasses Gates.
Stebbins Pattern ....dis 62½&10 %
" Genuine ....dis 60&10 %
" Tinned Ends ....dis 40&10 %
Bush's ....dis 20 %
Lincoln's Genuine ....dis 62&10 %
Weed's ....dis 15 %
Mortars and Pestles.
Iron ....net
Mortising Machines ....each $20.00. dis 20 %

Nails ....See Trade Report
Nuts and Washers.
Square and Hexagon ....7c off list
Nut Crackers
Table (Humason & Beckley Mfg. Co.) ....dis 33⅓ %
Blake's Pattern ....℘ doz $2.35, dis 10 %

Oakum.
Best ....℘ ℔ 10½c
U. S. Navy ....℘ ℔ 9½c
Navy ....℘ ℔ 8½c
Oilers.
Zinc and Tin ....dis 45 %
Brass and Copper ....dis 40 %
Olmsted's ....dis 40 %
Broughton's ....dis 40 %
Malleable (Hammer's) ....℘ doz $5.00, dis 10 %
Prior's Patent or "Paragon" ....dis 40 %
Ox Balls ....dis 60&10 %

Pencils.
Faber's Carpenters' ....dis 10 %
" Round Gilt ....℘ gross $5.25 net
Dixon's Lead ....℘ gross 4.50 net
" Lumber ....℘ gross 7.75 net
Pinking Irons ....℘ doz $2.75, dis 70 %
Picture Nails and Knobs.
Brass Head, Sargent's List ....dis 50&10&10 %

Porcelain Head " ....dis 50&10&10 %
" " Judd's List ....dis 40 %
" " T. & S. Mfg. Co ....dis 40 %
Plaiting Machines.
Astor Plaiting Machine ....each $15.00, dis 20 %
Crown Plaiting Machines ....dis %
6in., $6.00. 10in., $10.00, each.
Planes and Plane Irons.
First Quality ....dis 35@40 %
Second " ....dis 55@55&10 %
Bailey's Patent Adjustable, new list Jan. '77, dis 25&10 %
Bailey's "Victor" " " ....dis 25&10 %
Defiance Adjustable, new list ....dis 25&10 %
D. R. Barton Tool Co ....dis 20 %
Sandusky ....dis 35 %
Ohio Tool Co ....dis 35 %
Plane Irons, Butcher's ....$5.50 to £ gold
" Buck Bros ....$5.00 to £ gold
" Bailey's Patent ....dis 25&10 %
" Auburn Tool Co.'s ....dis 25 %
" Defiance ....dis 25&10 %
" D. R. Barton Tool Co ....dis 20 %
" Middletown Tool Co ....dis 10 %
" Ohio Tool Co ....dis 10 %
" Spear & Jackson's ....$5.00 to £ gold
" Sandusky Tool Co ....dis 10&10 %
Pliers and Nippers.
Button's Patent ....dis 33⅓ %
Hull's Patent Nippers, No. 1, $15; No. 2, $21 ℘ doz, dis 25 %
Humason & Beckley Mfg. Co ....dis 33⅓ %
Gas Pliers ....dis 30&10 %
Eureka Pliers and Nippers ....dis 25 %
Russell's Parallel ....dis 25 %
P. S. & W. Cast Steel ....dis 30 %
Plumbs and Levels.
Disston's ....dis 60&10 %
Stanley R. & L. Co.'s Pat. Adjustable ....dis 60&10 %
" " " Non-Adjustable ....dis 60&10 %
Chapin's ....dis 60&10 %
Standard Rule Co.'s New Adjustable ....dis 60&10 %
" " Non-Adjustable ....dis 60&10 %
Johnson's Patent Adjustable ....dis 60&10 %
Davis' Patent ....dis 60&10 %
Pocket Levels ....dis 60&10 %
Post Hole and Tree Augers.
Samson Post Hole Digger ....per doz $36.00, dis 20 %
Fletcher Post Hole Augers ....℘ doz 36.00, dis 20 %
Vaughan's Post Hole—
6 in. $23.60; 7, 8 and 9 in. $25 per doz ....dis 20 %
Leed's ....$5.00 each, dis 35 %
Potato Parers, &c.
Bay State ....℘ doz $12.00 net
"Saratoga" Peeler and Slicer ....℘ doz 9.00 net
Pruning Hooks.
Disston's Combined Pruning Hook and Saw per doz $18.00, dis 20 %
" Pruning Hook ....11.50, dis 20 %
Pulleys.
Judd's Axle ....℘ doz $0.50, dis 20&10 %
Hot House and Tackle ....dis 66⅔&10 %
Jap'd Screw ....dis 66⅔&10 %
Brass Screw ....dis 60&10 %
Jap'd Side ....dis 66⅔&10 %
" Clothes Line ....dis 66⅔&10 %
Hay Fork ....Solid Eye, $4.50; Swivel, $5.00, dis 40 %
Screw, Swing and Slide (T. & S. Mfg. Co) ....dis 33⅓ %
Pumps.
Douglas Cistern, etc ....new list dis
" S. & F ....new list dis 35 %
Union Mfg. Co.'s Cistern and Pitcher ....dis 25 %
" " " Rams ....dis 20 %
" " " Garden Engines ....dis
Punches.
Belt or Drive ....℘ doz $2.00; 2.25; 2.50, dis 30 %
Spring ....℘ doz $0.40, dis 25&10 %
" Leach's Patent ....dis 15 %
" Bemis' ....dis 20 %
Solid. Tinners' ....℘ doz $1.44, dis 30 %

Rail.
Sliding Door, Wrought Brass ....℘ ℔ 40c dis 10 %
" Iron, Painted ..℘ foot 9c, dis 55&10 %
Barn Door, ⅛, ⅜ and ¾ inch ....dis 75&10 %
" for N. E. Hangers ....dis 70&10 %
Rakes.
Cast Steel ....dis 15 %
8 10 12 14 16 teeth.
$5.00 5.75 6.50 7.25 8.00
Malleable ....dis 15 %
10 12 14 teeth.
$3.60 4.00 4.40
Razor Straps.
Genuine Emerson ....dis 20 %
Badger's ....dis 20 %
Evans ....dis 40 %
Imitation Emerson ....℘ doz $2.75, dis 40&10 %
Hunt's ....dis 40&5 %
Chapman ....dis 10 @ 15 %
Torrey's ....dis 20 %
Saunder's ....dis 10 @ 15 %
Rivets.
Iron and Tinned ....dis 40 %
In bulk, new list of Jan. 10, 1878 ....dis 30 %
Copper Rivets and Burs ....dis 10 %
Nos ..7 8 9 10 11 12 13 14 15
℘ ℔ ..49c 50c 52c 54c 56c 58c 60c 65c 70c
Rivet Sets ....dis 30 %
Road and Levee Scrapers.
Doty's Revolving ....dis 30 %
Rods.
Stair ....dis 50 %
" American Patent ....dis 33⅓ %
Rollers.
Barn Door, Sargent's list ....dis 70&5&10 %
Novelty ....dis 10 %
Acme (Anti-Friction) ....dis 50 %
Rope. Manufacturers' List, Jan. 2, 1878
Manila ....½ inch and larger ℘ ℔ 12½c
" ....⅜ inch ℘ ℔ 13 c
" ....¼ and 5-16 inch ℘ ℔ 13½c
" Tar'd Rope ....℘ ℔ 12 c
" " Lath Yarn ....℘ ℔ 13½c
" Hay Rope ....℘ ℔ 12½c
Sisal ....½ inch and larger ℘ ℔ 11 c
" ....⅜ inch ℘ ℔ 11½c
" ....¼ and 5-16 inch ℘ ℔ 12 c
" Hay Rope ....℘ ℔ 11 c
Rules. Boxwood. Ivory.
Chapin's ....dis 60&10 % dis 50&10 %
Stanley ....dis 60&10 % dis 50&10 %
Standard ....dis 60&10 % dis 50&10 %
Stephens' ....dis 60&10 % dis 50&10 %
Willis, Thrall & Son ....dis 60&10 % dis 50&10 %
Stearn's ....dis 50&10 % dis 40&10 %

Sad Irons.
From 4 to 10 lbs ....℘ ℔ 2½c net
Self-Heating ....℘ doz $9.00 net
" Tailors' ....℘ doz $19.00 net
Enterprise Patent Cold Handle ....dis 33⅓ %
Combined Fluter and Sad Iron ..per doz $15.00, dis 15 %
Sand Paper.
Baeder & Adamson's Flint, 00 to 1½ ..$4.25 ℘ ream
" " " 2, 2½ & 3. 4.75 ℘ ream
" " Assorted 4.25 ℘ ream } dis 15 %
" " Star ....3.25 ℘ ream
" " Emery ..℘ ream $6.50 @ 11.50
New England, same list as B. & A. Flint ....dis 15 %
Sash Cord.
Common ....℘ ℔ 16 @ 18c net
Patent ....℘ ℔ 18c net
Silver Lake. Russia Flax ....℘ ℔ 55c net
" White Cotton ....℘ ℔ 55c net
" Drab Cotton ....℘ ℔ 60c net
Raw Hide ....dis 25 %
Sash Locks.
Clark's, No. 1, $10.00; No. 2, $8.00 per gross ...dis 40@45 %
Ferguson's ....dis 33⅓ %
Norwich ....dis 25 %
Walker's ....dis 10 %
New England ....dis 20 %
Hammond's Window Springs ....dis 25 %
Northup Window Springs ....$9.00 per gross, dis 10 %
Sash Weights.—Solid Eyes ....℘ ℔ 1¼c
Sausage Stuffers or Fillers.
Miles ....℘ doz $20, dis 30 %
Perry ....℘ doz, No. 11, $15; No. 10, $21, dis 30 %
Draw Cut No. 4 ....each $30.00, dis 20 %
Enterprise Mfg. Co ....dis 20 %
Silver's ....dis 25 %
Saws.
Spear & Jackson's ....$3.50 to £ gold
Disston's Circular ....dis 30 %
" Mill ....dis 30 %
" Cross Cut ....dis 20 %
" Hand, Panel, Rip, &c ....dis 20 %
H. W. Peace's Circulars ....dis 25 %
" Mill, Gang and Mulay ....dis 25 %
" Cross Cut, Wood, Hand, &c ....dis 20 %
E. M. Boynton's Lightning, Cross Cuts ....dis 50&5 %
" One-Man, all lengths ....dis 40&5 %
" Buck Saws (X Bar) ..℘ doz $15, dis 40&10 % } 2 % cash.
" Billet Webs ....℘ doz $10, dis 40&5 %
" Pruning ....dis 40 %
Wheeler & Clemson Mfg. Co.'s Hand ....dis 20 %
" " " Cross-Cut ....dis 35 %
Livingston's Butcher and Kitchen ....dis 20 @ 25 %
" Framed Wood—
Nos 101 102 103 104 105
Per doz ..$10.00 8.50 10.00 7.50 6.25 net
Saw Frames.
White, Vermont ....℘ doz $1.35, dis 15 %
Red. Polished and Varnished ....℘ doz $2.00, dis 15 %
Saw Rods ....$10 list dis, 10&10 %
Saw Sets.
Boynton's Patent ....dis 40 %
Stillman's Genuine ....℘ doz $4.25 net
" Imitation ....℘ doz $3.25, dis 25 %
Common Lever ....per doz $2.00, dis 25 %
Leach's ....No. 0, $8.00; No. 1, $15.00, dis 15 %
Nash's ....No. 1, $8.50; No. 2, $5.50, dis 20&10 %
Hammer, Hotchkiss ....$5.50, dis 10 %
" Bemis & Call's ....dis 20 %
" Aiken's Genuine ....$13.00, dis 40&10 %
" " Imitation ....$7.00, dis 40 %
" Hart's Patent Lever ....dis 20 %
Scales.
Hatch, Counter ....℘ doz $36, dis 40 %
" Tea ....℘ doz $16. dis 40&10 %
Union Platform ....$6.00, $7.00, dis 45 %
Turnbull's ....dis 20 @ 25 %
Brown's ....dis 25&5 %
Fairbanks' ....dis 20&5 %
Howe's ....dis 20&5 %
Chatillon's Grocers' ....dis 25 %
" Eureka ....dis 20 %
Universal Family ....dis 25 %
Favorite Family ....dis 25 %
Scale Beams, new list ....dis 25 %
Scrapers.
Box, 1 Handle ....℘ doz $5.00, dis 10 %
" 2 " ....℘ doz 6.00 dis 10 %
Defiance Box and Ship ....dis 25&10 %
Foot ....dis 60&10 %
Ship (common) ....per doz $3.00 net
" (Providence Tool Co ....dis 10 %

Screw Drivers.
Hart, Bliven & Mead, new list.......dis 45&10 %
Douglass Mfg. Co.......dis 35&10 %
Disston's.......dis 45 %
Buck Bros.......dis 25 %
Stanley Rule & Level Cos.,Black Handles...dis 35&10 %
" " " Varnished H'le..dis 45&10 %
Sargent & Co.'s.......dis 60&10 %
Screws.
Flat H'd Iron list Sept. 1, '75.......dis 60 %
Round Head Iron ".......dis 50 %
Flat Head Brass, list Sept. 1, '75.......dis 55 %
Round Head Brass, list Sept. 1, '75.......dis 40 %
Brass and Silver Capped.......dis 40 %
Japanned, list of Plain Screws.......dis 45 %
Lag or Common Coach.......dis 65&10 %
Coach, Patent Gimlet Point.......dis 45 @ 50 %
Bed.......dis 10 %
Machine, Flat Head, Iron, Am. Screw Co.......dis 25 %
" Round Head, Iron, " ".......dis 20 %
Bench, Iron.......dis 55&10 %
" Wood, Beach.......⅌ doz $3.00, net
" " Hickory.......dis 20&10 %
Hand.......dis 25&10 %
Hand Rail, Sargent's.......dis 60&10 %
" " Humason, Beckley & Co.'s.......dis 40&10 %
Jack, Bell Bottom.......dis 20 %
Sash (T. & S. Mfg. Co.).......dis 25 %
Scythes.
Blood's German Steel, Grass.....⅌ doz $10.00 }
" Cast, " .....⅌ doz 11.00 } dis $1.50
" Silver " " .....⅌ doz 12.00 } from list
" German " Grain.....⅌ doz 14.00 }
" Cast " " .....⅌ doz 15.00 }
" Excelsior and Granger..⅌ doz 11.00 } dis $1.50
" Young America.......10.50 } from list
" Silver Clipper.......13.00 }
Wadsworth's Grass.......dis 30 %
" Bush.......dis 20 %
Scythe Snaths.......dis 20 %
Shears and Scissors.
American".......dis 45&5 %
Cast Steel.......dis 75 & 10 %
" Iron.......dis 45 %
Seymour's Straight Trimmers.......dis 60 %
" Scissors.......dis 60 %
Pruning.......⅌ doz $5.50 @ $6.00 net
Barnard's Lamp Trimmers.......⅌ doz $3.75
Sheep Shears.
Ball's Pat. Solid Steel Bent.......gold, net
Inches....... 5 5½ 6
Per doz....... $8.25 $8.75 $9.25
Sheaves.
Sliding Door, M. W. & Co., list.......dis 35&10&2 %
" R. & E. list.......dis 50&2 %
" Patent Roller.......dis 25&2 %
" " " Hatfield's.......dis 50&2 %
" Russell's Anti-Friction.......dis 50&2 %
Sliding Shutter, R. & E. list.......dis 50&2 %
" " Sargent's list.......dis 55&10 %
Moore's Anti-Friction.......dis 45 %
Shovels and Spades.
Ames.......dis 32½ %
" not stamped "Ames".......dis 37½ %
Rowland's.......dis 50 %
Kimball Shovel Co.......dis 20 @ 20&5 %
Old Colony.......dis 30 %
Middleboro' Shovel Co.......dis 30 %
Remington's (Lowman's Patent).......dis 30 %
Dunning's Shovels and Scoops.......dis 20&7½ %
B. Rowland & Co., Anchor Brand.......dis 50 %
" " Patent.......dis 40 %
Oxford Patent.......dis 40 %
Shovels and Tongs.
Iron and Brass Head, R. & E. list.......dis 50&2 %
" " Hart's.......dis 55&10&2 %
Polished Steel.......dis 50&2 %
Slates.
Square Frames, Round Cornered, by case.......dis 70 %
Less than a case.......dis 65&10 %
Spokes.
North Carolina Handle Co.......dis 20 %
Spoke Shaves.
Defiance Metallic.......new list, dis 25&10 %
Iron.......dis 33⅓&10 %
Wood.......dis 30 %
Bailey's.......dis 25&10 %
Spoke Trimmers.
Bonney's.......⅌ doz $10.00, dis 40 %
Stearn's.......⅌ doz $10.00, dis 40 %
Ives'.......No. 1, $15.00; No. 2, $12.00 ⅌ doz, dis 40&10 %
Douglass'.......⅌ doz $9.00, dis 20&10 %
Spoons.
Tinned Iron.......dis 15@20 %
Basting.......dis 30 %
Britannia.......dis 55 @ 60 %
" Boardman's.......dis 55 %
Derby Silver Co.......dis 40&5&5 %
L Boardman's Sons, A1.......dis 40&5&5 %
Rogers & Bro., A 1.......dis 40&5 %
Reed & Barton.......dis 40&5 %
Rogers Cutlery Co.......dis 40&5&5 %
Hall & Elton.......dis 40&5 %
Holmes, Booth & Haydens.......dis 40&5 %
German Silver (Hall & Elton).......dis 30&5 %
German Silver (L. Boardman's Sons).......dis 30&5 %
Diamond Steel (L. Boardman's Sons).......dis 30&5 %
Tin (P. S. & W.), Teas.......$1.50 ⅌ gross, net
" " Tables.......$2.50 ⅌ gross, net
Tin Cowles Hdw. Co.).......dis 10 %
" " " case lots.......dis 20 %
Stocks and Dies........dis 5&10 %
Stone.
Hindostan Stone.......⅌ ℔ 6c }
" Ax Stone.......⅌ ℔ 8c } dis 25&10 %
" Slips.......⅌ ℔ 10c }
Sand Stone.......⅌ ℔ 6c, dis 25&10 %
Washita Stone.......No. 1, ⅌ ℔ 30c, net
" ....No. 2, ⅌ ℔ 25c, net
" Slips.......No. 1, ⅌ ℔ 60c, net
Arkansas Stone.......No. 1, ⅌ ℔ $1.35, net
" Slips.......No. 1 ⅌ ℔ $2.50, net
Grindstones, Family, Loring's.......dis 10 %
Stove Polish.
Joseph Dixon's.......⅌ gross $6.00, dis 5 %
Gem.......⅌ gross $4.50, dis 5 %
Gold Medal.......⅌ gross $6.00, dis 25 %
Rising Sun.......⅌ gross $5.75, net
Squares.
Steel.......dis 50 %; full cases, dis 50&10 % } 2 %
Iron.......dis 50 %; full cases, dis 50&10 % } cash
Nickel Plated.......add $2.50 @ $4.00 ⅌ doz, net }
Try Squares and T Bevels.......dis 45&10 %
Star Try Squares and Bevels.......dis 35 %
Disston's Try Squares and T Bevels.......dis 45 %
Winterbottom's Try and Mitre.......dis 20&10 %
Bailey's Try Squares and T Bevels.......dis 25&10 %
Tacks, Brads, &c.—List of January 1, 1876.
Tacks, Half Weight, American.......dis 75
" Full " ....dis 50
" Half " Swedes.......dis 65
" Full " " ....dis 30
" Tinned.......dis 30
" Carpet, Am. and Swedes.......dis 20 } Extra
" " Leather Head.......net } 30 %
" Tinned.......dis 40 } to
" Copper.......58c, net } 40 %
Brads, Half Weight.......dis 50
Shoe Nails—
4-8ths and longer, 8c; 3½-8ths 9c ⅌ ℔.net
Trunk, Clout and Finishing Nails—
½ ⅝ ¾ ⅞ 1 1⅛ in. and over.
25 20 17 15 13 11c ⅌ ℔.......net
Double-Pointed Tacks.......dis 40&5 %
Tap Borers.
Common and Ring.......dis 20&10 %
Ives' Tap Borers.......dis 10&10 %
Enterprise Mfg. Co.......dis 20 %
Tapes, Measuring.
American Flask and Cap Co.......dis 20 %
Eddy's.......dis 20 %
Spring Tapes.......dis 25&10 %
Tea Trays.
American Tea Tray Co.......dis 15 %
Thermometers.
Tin Case.......dis 60&5&10 %
Tobacco Cutters.
Enterprise Mfg. Co. (Champion).......dis 20 %
Wood Bottom.......⅌ doz $12.00, dis 30&10 %
All Iron.......⅌ doz $10.50, dis 40&5 %
Nashua Lock Co.'s.......⅌ doz $18.00, dis 50 %
Toe Calks.
Winsted.......⅌ ℔ 10c. dis 10 %
Tinners' Tools and Machines.
Machines (P. S. & W.).......dis 5@10 %
Tools (P. S. & W.).......dis 15@20 %
Traps.
Game, Newhouse.......dis 30 %
" Newhouse Pattern.......dis 60 %
" Blake's Patent.......dis 40&10 %
Mouse, Wood, Choker.......⅌ doz holes, 13½c
" Patent Choker (Union
Nut Co).......⅌ doz holes, 16 @ 18c, net
" Round Wire.......⅌ doz $1.50, dis 10 %
" Cage ".......⅌ doz $2.50, dis 10 %
" Patent Self Setting.......⅌ doz holes, 25c, net
" Catch-em-alive.......⅌ doz $3.50, dis 10 %
Rat, "Decoy".......per doz $10.00, dis 10 %
Trowels.
Lothrops Brick and Plastering.......dis 10 %
Disston's Brick and Plastering.......dis 20 %
Peace's Plastering.......dis 20 %
Clement & Maynard's.......dis 20 %
Rose's Brick.......dis 15 %
Brades' Brick.......gold, dis 20 %
Worrall's Brick and Plastering.......dis 20 %
Garden.......dis 25&10 %
Triers.
Butter and Cheese.......dis 25 %
Tuyere Irons.
Vulcan Pattern.......$3.50 each, net
Vises.
Solid Box, Trenton.......40 to 160 lbs., 12½c, net
" Wilson's....... { 30 to 160 lbs., 18c, } { 160 and over, 22c, }
" "Crown" (A. H. Hildicks) 40 to 100 lbs., 15c currency, dis 20 %
" Peter Wrights.......15½c, gold
Parallel, Parker's.......dis 20 %
" Wilson's.......dis 40 %
" Sargent's.......dis 60&10 %
" Trenton.......dis 25 %
" Backus and Union.......dis 25 %
" Merrill's.......dis 15 %
" Fisher & Norris.......dis 15&10 %
" Buffalo.......dis 25 %
" Stevens'.......dis 25 %
" Simpson's Adjustable.......dis 25 %
Saw Filers, Bonney's.......⅌ doz $24.00, dis 20&10 %
" Stearn's.......dis 20&10 %
" Hopkins'.......⅌ doz $17.50, dis 10 %
Lowell Hand Vises.......dis 20 %
Ventilators.
Protective (upper) per foot, $1.00....... } dis 25 %
" (lower) " 1.50....... }
Washer Cutters.
Smith's Patent.......⅌ doz $12.00, dis 10 %
Johnson's.......⅌ doz $12.00, dis 25 %
Penny's.......⅌ doz $14.00 and $16.00, dis 20&10 %
Appleton's.......⅌ doz $8.00, dis 10&10 %
Washers.—See Nuts and Washers.
Weather Strips.
Protective Ventilator Co.'s.......dis 25 %

Well Wheels.—Revised list.......dis 60&10 %
Wire.
Brass and Copper....... List of Jan. 1, 1878 dis 10 %
Bright and Annealed.......Nos. 0 @ 18, dis 57½ @ 60 %
" " ....Nos. 19 @ 26, dis 60 @ 62½ %
" " ....Nos. 27 @ 36, dis 62½ @ 65 %
Coppered.......Nos. 0 @ 18, dis 52½ @ 55 %
Galvanized, Nos. 0 to 6.......⅌ ℔ 10c, dis 30 @ 35 %
" Nos. 7 to 18.......market list, dis 30 @ 35 %
Tinned, Nos. 0 to 18.......dis 45 @ 47½ %
Cast Steel.......dis 25 @ 30 %
Tinned Broom Wire, Nos. 18 to 25.......dis 47½ @ 50 %
Annealed Fence, Nos. 8 and 9.......dis 57½ @ 60 %
Grape, Nos. 10 to 14.......dis 57½ @ 60 %
Galvanized Telegraph, Nos. 7 to 9.......⅌ ℔ 8½c
" " Nos. 10 and 11.......⅌ ℔ 9½c
" " No. 12.......⅌ ℔ 10c
Fence Staples.......⅌ ℔ 7 @ 7½c
" Staples, Galvanized.......⅌ ℔ 9½ @ 10c
Stubs Steel Wire.......$7.00 to £ gold
Japanned Barb Fence.......⅌ ℔ 14c
Galvanized ".......⅌ ℔ 16c
Steel Music Wire, Nos. 12 to 27.......⅌ ℔ $1.00, net
Judd's Picture Wire.......dis 80&20 %
Clothes Line Wire, Galvanized.......⅌ coil 38 @ 43c net
Wire Cloth.
Clinton, green or drab, by the roll..per sq. ft. 3⅜c net
Wrenches.
American Adjustable.......dis 45 %
Baxter's Adjustable "S," New list May 1, '76.......dis 20 %
" Diagonal, " " ....dis 20 %
Collins & Co.'s.......dis 45 %
Coes' Genuine.......dis 50&10 %
" Pattern (Wrought).......dis 60&10 %
" " (Malleable).......dis 75&10 %
Girard.......dis 50&10 %
Hull & Belden's "Climax".......dis 25 %
Knight's Patent.......dis 25 %
Lindsay's ".......dis 25 %
Taft's Pattern.......dis 75&10 %
Davis' Patent Duplex.......new list, dis 25 %
Bemis & Call's Patent Combination.......dis 25 %
" " Merrick's Pattern.......dis 25&2½ %
" " Briggs' Patent.......dis 2
" " Cylinder or Gas Pipe.......dis 25 %
Aiken Pocket (Bright).......$8.00, dis 50&10 %
Wringers........Per doz.
Universal, Cog Wheels, No. 2½, small fam'y size.$60.00
" " " No. 2, usual ".......63.00
" " " No. 1½.......71.00
Crown No. 2.......54.00
" No. 2½.......63.00
" No. 3.......69.00
Eureka, No. 1.......57.00
Novelty, No. 10, with Cog Wheels.......60.00
" No. 2, " ".......63.00
" No. 22, " ".......67.00
Excelsior, No. A, with Folding Bench.......84.00
" No. E, for Set Tubs.......66.00
Keystone No. 1, Wood Frame, no Gear.......54.00
" No. 2, Iron " ".......54.00
" No. 10, Wood " Common Gear.......60.00
Peerless, No. 2.......63.00
" No. 3.......71.00
" No. 2½.......60.00

Stamped Tinware.
Common Stamped Ware.......dis 50 %
Stamped Deep and Retinned Ware.......dis 40 %

METALS.

IRON.—Duty: Bars, 1 to 1½c. ⅌ ℔; Sheet, Band Hoop and Scroll, 1½ to 1⅞c. ⅌ ℔; provided, that none of the above Iron shall pay a less rate of duty than 35 per cent. Pig, $7 ⅌ ton; Polished Sheet, 3c. ⅌ ℔; Wrought Scrap, $8 ⅌ ton; Cast Scrap, $6 per ton. Railroad, 70c. ⅌ 100 ℔s. Boiler and Plate, 1½c. ⅌ ℔.

Pig Iron—AMERICAN.
Foundry No. 1.......⅌ ton $18.00 @ 19.00
" No. 2.......⅌ ton 17.00 @ 18.00
Gray Forge.......⅌ ton 16.00 @ 17.00
SCOTCH.
Glengarnock.......⅌ ton @ 25.00
Eglinton.......⅌ ton 23.50 @ 24.00
Coltness.......⅌ ton 26.00 @ 26.50
Rails.
Iron, at mill.......⅌ ton $32.00 @ 37.00
Steel, ".......⅌ ton 43.00 @ 44.00
Old Rails.......⅌ ton 19.00
Scrap.
Wrought Scrap, from yard.......⅌ ton 22.00

Bar Iron, from Store.
Common Iron:
¾ to 2 in. round and square....... } ⅌ ℔ 1.9c
1 to 6 in.x⅜ to 1 in....... }
Refined Iron:
¾ to 2 in. round and square....... } ⅌ ℔ 2.1c
1 to 6 in.x⅜ to 1 in....... }
1 to 6 in.x¼ and 5-16.......⅌ ℔ 2.3c
Rods—⅝ and 11-16 round and square.......⅌ ℔ 2.2c
Bands—1 to 6x3-16 to No. 12.......⅌ ℔ 2.5c
Swedish Iron:
Ordinary sizes.......5c

Sheet Iron.

	Common American.	R. G. American.
Nos. 10 to 20	⅌ ℔ 3 c	4
21 to 24	⅌ ℔ 3¼c	4
25 to 26	⅌ ℔ 3⅜c	4¼
27	⅌ ℔ 3¾c	4¼
28	⅌ ℔ 4 c	4¾c

	Prime	2d qual.
Galvanized, 14 to 20	⅌ ℔ 7 c	⅌ ℔ 6 c
21 to 24	⅌ ℔ 7¾c	⅌ ℔ 6½c
25 to 26	⅌ ℔ 8¼c	⅌ ℔ 7 c
27	⅌ ℔ 8¾c	⅌ ℔ 7½c
28	⅌ ℔ 9¼c	⅌ ℔ 8 c

Patent Planished.......⅌ ℔ A, 10½c; B, 9c
Russia, Nos. 8 to 16.......⅌ ℔ 11 @ 11¼c
American Cold Rolled.......⅌ ℔ 4½c

COPPER.—Duty: Pig, Bar and Ingot, 5c; Old Copper, 4c ⅌ ℔; Manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem.
American Ingot.......⅌ ℔ See Trade Report.
SHEATHING, BRAZIERS' COPPER, BOLTS, &C.
Braziers' Copper, ordinary sizes, over 16 oz., ⅌ sq. ft.......⅌ ℔ 28c
Braziers' Copper, ordinary sizes, 16 oz. and over 12 oz., ⅌ sq. ft.......⅌ ℔ 30c
Braziers' Copper, 10 oz and 12 oz., ⅌ sq. ft.......⅌ ℔ 32c
" " Lighter than 10 oz. ⅌ sq. ft.......⅌ ℔ 34c
Circles less than 84 in.in diameter.......⅌ ℔ 31c
Circles 84 in. diameter and over.......⅌ ℔ 34c
Segment and Pattern Sheets.......⅌ ℔ 31c
Locomotive Fire Box Sheets.......⅌ ℔ 28c
Sheathing Copper, over 12 oz. ⅌ sq. ft.......⅌ ℔ 26c
Bolt Copper.......⅌ ℔ 28c
Copper Bottoms.......⅌ ℔ 30c
No Copper is Sheathing except 14x48 inches and not to exceed 34 oz. to the sq. ft.
TINNING.
14x48, by the case.......⅌ sheet 6c
14x48, less than case.......⅌ sheet 8c
For tinning both sides, double the above amount.
O'NEILL'S PATENT PLANISHED COPPER.
14x48.
14 and 16 oz. and heavier..⅌ ℔ 34c By the case.⅌ ℔ 33c
12 oz. and lighter.......⅌ ℔ 37c " " .⅌ ℔ 36c
Boiler Sizes.
7 in., 14x52. 8 in., 14x56. 9 in., 14x60.
14 and 16 oz. and heavier. ⅌ ℔ 36c By the case. ⅌ ℔ 35c
(And all sizes not over 20 in. wide.)
30x60.
14 and 16 oz. and heavier.......⅌ ℔ 38c
12 oz.......⅌ ℔ 41c

Brass.
Brown & Sharp's Gauge the Standard for Metal; Old English Gauge the Standard for Wire.
BRASS MANUFACTURERS' PRICE LIST.
January 1, 1878.
Cash prices for Roll and Sheet Brass. For less quantity than 100 ℔s. add 3c ⅌ ℔.
HIGH BRASS.
All Nos. not thinner than to No. 28, wider than 2 in., not wider than 14 in.......27c
All Nos. to No. 28, inclusive, and widths over 14 to 20 in., inclusive.......33c
All Nos. to No. 28, inclusive, and widths over 20 to 30 in., inclusive.......37c
½c. ⅌ ℔ advance on each No. above Nos. 28 to 38, inclusive.
All Brass thinner than No. 38 is Platers' Brass, at...50c
Sheets 24x48, and all sheets cut to particular sizes and lengths under 30 in., in width wider than 2 in. 36c
Printers' Rules.......44c
Sheets wider than 30 in. and under 40 in.......45c
" " 40 in. and over.......47c
Circular Sheets, in diam. from 4 in. to 14, inclusive.39c
" " over 14 " 20, " ..44c
" " " 20 " 30, " ..48c
" " " 30 " 40, " ..51c
" " " 40 in.......54c
LOW BRASS.
40 ⅌ ℔ more than High Brass.
Gilding Metal, 8c ⅌ ℔ more than High Brass.
Platers' or Gold Metal { In Bars.......46c { Sawed.......49c { Planed or Polished.......52c
FOR SLITTING.
Metal in width 2 in. to ½ in. to No. 28, inclusive, 1c. ⅌ ℔ advance.
Metal, in width 2 in to 1 in., thinner than No. 28, 2c. ⅌ ℔ advance.
Metal, in width 1 in. to ½ thinner than No. 28, 3c ⅌ ℔ advance.
Metal, in width ½ in. to ¼, inclusive, not thinner than No. 28, 2c. ⅌ ℔ advance.
Metal, in width ½ in. to ¼ thinner than No. 28, 5c. ⅌ ℔ advance.
Metal, ¼ in. in width and less, 10c. ⅌ ℔ advance.
Any of the above widths cut to particular lengths, add 7c. ⅌ ℔.
GERMAN SILVER MARKET METAL AND WIRE.

	Market Metal.	Wire.
4 per cent., 12 inch, to No. 26	$0.55	$0.75
6 " " "	.61	.83
10 " " "	.73	.99
15 " " "	.88	1.19
18 " " "	.97	1.31

German Silver Sheets over 12 in. wide and weighing more than 16 ℔s., $2.25 ⅌ ℔.
Advance 2c. for each additional inch in width above 12 in., and 2c. ⅌ ℔ on each No. thinner than Nos. 26 to 36, inclusive.
All German Silver thinner than No. 36 is Platers, at 50c ⅌ ℔ additional.
German Silver Scrap one-third less than net price of 12 in. Market Metal. German Silver Turnings, Filings and Chips, half the price of Scrap.
BRASS AND COPPER WIRE.

	High Brass.	Low Brass.	Gild'g and Copper.
No. 0 to 20	$0.30	$0.34	$0.40
No. 21	.33	.37	.43
No. 22	.34	.38	.44
No. 23	.35	.39	.45
No. 24	.37	.41	.47
No. 25	.40	.44	.50
No. 26	.42	.46	.52
No. 27	.45	.49	.55
No. 28	.49	.53	.60
No. 29	.52	.56	.64
No. 30	.55	.59	.69
No. 31	.59	.63	.75
No. 32	.63	.67	.81
No. 33	.67	.71	.90
No. 34	.71	.75	1.00

Spring Wire 2c ⅌ ℔ advance.
Flat, Square and Half Round Wire 5c ⅌ ℔ advance on Round Wire.
Fancy Wire not less than 10c ⅌ ℔ advance of Round Wire.
Brass Rods, No. 8 and smaller not less than 2 feet lengths, 45c.
Wire straightened and cut, smaller than No. 8, and not less than 2 feet lengths, 40c.
Wire and Rods less than 2 feet lengths, special rates.
Twelve cents per ℔ extra for spooling on 1 ℔ spools.
MISCELLANEOUS.
Common Plain Brass Pail Ears.......$0.40
Brass Door Rail.......40
SCRAP.
High Brass Scrap.......13c
Low ".......14c
Gilding.......17c
Turnings, Filings and Chips half the price of Scrap.
Terms—Net cash. Interest to be added after thirty days.
TUBING.—dis 10 % ⅌ ℔
Plain to No. 20 inclusive, above ¼ in. to 3 in.......$0.40
" above 3 in.......50
Nos. 21, 22, 23, two cents advance on List for each Number.
Nos. 24, 25, 26, four cents advance on List for each Number.
Above No. 26, special rates.
Plain, ¼ inch.......70
" 3-16 ".......1.10
" ⅛ ".......1.60
All Mandrel Drawn Tubes, 5 cents advance on List Prices.
Fancy Tubing to No. 20.......48c
English, Scotch and Extra Patterns Fancy Tubing to No. 20.......53
Tubing Sawed or Cut 2 to 4 feet long, 2 cents advance on List.
Add to 2 cents ½ cent for each additional cutting under 2 feet.
All Mandrel Drawn Tubes under ⅝ in., 25 cents per pound advance.
ZINC TUBING.—net.
Plain.......22
Fancy.......28
Scotch and Extra Patterns.......31
GERMAN SILVER TUBING.—dis 10 %
4 Per cent.......85
6 " 95
9 " 1.10
12 " 1.25
15 " 1.40
16 " 1.45
18 " 1.55
20 " 1.60

STEEL.—Duty: Bars, Ingots, Sheets and Coils, valued at 7 cents ⅌ ℔., or under, 2¼ cents; over, 7 cents, and not above 11, 3 cents ⅌ ℔; over 11, 3½ cents ⅌ ℔, and 10 % ad val. Railway Bars, 1¼ cents ⅌ ℔. Railway Bars, in part Steel, 1 cent ⅌ ℔. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as
American Cast Steel.
Tool.......15c
Spring.......7c
Homogeneous.......12½c
Boiler Plate.......8c
Tire.......5½c
Machinery (round and square).......9c
File.......9c
Sheet.......11 @ 16c
Saw Plate, mill and mulay.......14 @ 16½c
" gang and X cut.......13 @ 14c
" circular as to size.......18 @ 30c
Chrome Steel.
Tool.......⅌ ℔ 14 @ 15c
Tool, extra fine.......⅌ ℔ 40 @ 75c
Spring.......⅌ ℔ 8 @ 9c
Machinery.......⅌ ℔ 8 @ 10c
Gun or Homogeneous.......⅌ ℔ 12 @ 16c
English Steel.—Payable in gold, net.
" Best Cast.......⅌ ℔ 15½c
" Extra Cast.......⅌ ℔ 16½c
" Round Machinery, Cast.......⅌ ℔ 10c
" Swaged, Cast.......⅌ ℔ 18c
" Best Double Shear.......⅌ ℔ 15½c
" Blister, 1st quality.......⅌ ℔ 13c
German Steel, Best.......⅌ ℔ 11c
" 2d quality.......⅌ ℔ 10c
" 3d quality.......⅌ ℔ 9c
Sheet Cast Steel, 1st quality.......⅌ ℔ 15½c
" " 2d quality.......⅌ ℔ 14½c
" " 3d quality.......⅌ ℔ 12½c
ANTIMONY.......13 to 13½c
LEAD.—Duty: Pig $2 ⅌ 100 ℔s; old Lead, 1½c ⅌ ℔. Pipe and Sheet, 2⅝c ⅌ ℔.
Spanish.......6⅝ @ 6¾c gold
German Refined.......6¾c gold
English.......6¾ @ 7c gold
American.......4¼ @ 4⅜c
Bar.......7c, dis 10 %
Pipe.......7½c, dis 10 %
Tin Lined Pipe.......15c, dis 10 %
Sheet.......8c, dis 10 %
Shot.......Drop 8¾ Buck, 9¾c, dis 10 %
BABBITT METAL.
N. P. U.......⅌ ℔ 7½ @ 8c
A 20c; B, 16c; C, 12c; D, 10c ⅌ ℔.
TIN.—Duty: Plates, Sheets, Tagger and Terne, 1.1c ⅌ ℔; Electro-galvanized Plates, 2c ⅌ ℔; Manufactures of, not enumerated, 35 per cent. ad. val. Bars, Block and Pigs free. Banca, subject to duty of 10 per cent.
Banca.......⅌ ℔ 19 currency
Straits.......⅌ ℔ 17 @ 18 currency
English.......⅌ ℔ 16 @ 17 currency
TIN PLATES, CURRENCY PRICES
I C 10x14, 12x12, 14x20 Prime Charcoal.......$6.50 @ 6.75
I X 10x14, 12x12, 14x20 Prime Charcoal.......8.75 @ 9.00
D C 12½x17 ".......6.00 @ 6.25
D X 12½x17 ".......8.25 @ 8.50
For each additional X add.......2.25
COKE TIN PLATE.

	Best.	2d quality.	Ordinary.
I C 10x14, I C 12x12, I C 14x20	$6.25	6.00	5.50 @ 5.75

TERNE PLATE.

	Prime Char.	2d qual.	Coke.
I C 14x20	$6.12½ @ $6.25	5.75 @ 6.00	5.63 @ 5.75
I X 14x20	@ 8.50	....	....
I C 20x28	@ 13.25	12.50	11.50 @ 12.25
I X 20x28	@ 18.00	....	....
I C 20x200	@ 19.00		....
I C 14x20 M. F. Brand			$7.25 @ ....

SOLDER.......No. 1, 10 @ 11c; No. 2, 9¼ @ 9¾c
SPELTER—Duty: In Pigs, Bars and Plates, $1 ⅌ 100 ℔s.
Silesian, cash.......6¾ @ 7c gold
American, cash.......5.75 @ 6c
Lehigh, on spot.......10c
ZINC.—Duty: Pig or Block, $1.50 ⅌ 100 ℔s. Sheet, 2½c ⅌ ℔.
Sheet, Cask.......7c
" Open.......7¼@7½c

Paper Stock, Old Metals, &c

(Dealer's Selling Price.)
Canvas linen.......4 @ 4¼
" cotton, No. 1.......5¾ @ 6
" " No. 2....... @ 3½
White linen rags, No. 1.......5½ @ 5
" " No. 2.......3¼ @
Seconds.......2¼ @
Mixed woolens.......2½ @ 3¼
Soft woolens.......7 @ 7½
Gunny bagging.......3½ @
Jute Butts.......3 @ 3½
Kentucky bagging.......5 @
Waste paper and scraps.......1 @ 1½
Rope cuttings.......1½ @ 3
Kentucky bale rope.......4 @ 4½
Oakum junk, No. 1.......5½ @ 5¾
" No. 2....... @ 4
Grass rope.......3½ @
Tarred shaking.......2 @
White collar cuttings, all paper.......7 @
" " " muslin lined.......5 @
" " Envelope.......7 @
Hard White Shavings, No. 1.......5½ @
Soft " " No. 1.......4½ @ 4¾
White Shavings, No. 2.......4½ @ 4¾
Mixed Shavings, part white.......3½ @ 4
Imperfections, No. 2, best folded sheets.......4½ @
" No. 1, Heavy Stock.......4¼ @
Book Stock.......3½ @ 3¾
" Mixed.......4½ @
" " No. 2, light.......2 @
Newspaper Stock.......2¾ @
Prints.......1½ @ 2
Pure Manilas.......2¾ @ 2⅞
Bogus Manilas and Hardwares.......1 @
Commons.......½ @
Binders' Board Cuttings.......1 @ 1½
Straw Board Cuttings.......¾ @
Woolen Tailor Clips.......13 @ 14
Satinet ".......2 @ 2½
Old Metal.
Copper, heavy.......15 @
Copper Bottoms....... 13
Yellow Metal.......13 @
Brass, light.......9 @
" heavy.......10½ @
Heavy Composition.......13 @
Old Lead, solid....... @ 3½
Tea Lead....... @ 2¾
Zinc....... @ 4
Pewter, No 1.......10 @
" No. 2.......8 @
Wrought Iron.......per ton $18.00
Machinery Iron.......per ton 13.00
Light Iron.......per ton 12.00
Stove Plate.......per ton 10.50
Grate Bars.......per ton 6.00

Paints, Oils, &c.

Paints.
Black Lamp, Coach Painters.......⅌ ℔ 20c
" " Ordinary.......6c
" Ivory Drop, fair.......12 @ 15c
" " best.......29c
Black Paint, in oil....... kegs, 8c asst'd cans, 11c
Blue, Prussian, fair to best.......40 @ 50c
" " " " in oil.......35 @ 55c
Blue Chinese dry.......85c
" Ultramarine.......18 @ 30c
Brown, Spanish.......1¼c
" Van Dyke.......15c
Carmine, 40.......combination price
Green, Chrome.......15 @ 23c
" " in oil.......14 @ 18 @ 25c
" Paris.......good 25c; best, 30c
" " in oil.......30c; " 45c
Iron Paint, Bright Red.......⅌ ℔ 2¼c
" Red.......⅌ ℔ 2c
" Brown.......⅌ ℔ 1½c
" Purple.......⅌ ℔ 3c
" Ground in Oil, Bright Red.......⅌ ℔ 5½c
" " " Red.......⅌ ℔ 5c
" " " Brown.......⅌ ℔ 4½c
" " " Purple.......⅌ ℔ 6c
Mineral Paints.......1¼ @ 4c
Orange Mineral.......12c
Red Lead, American.......8c
" " English.......9½c gold
" Venetian (N. C.) dry.......$1.70 @ $1.75
" " in oil....... asst'd cans, 11c; kegs, 8c
" Indian dry.......12c
Rose Pink.......10 @ 13c
Sienna, American, Raw.......4c
" Burnt.......4½c
" " in oil.......10 @ 16 @ 20c
" Raw ".......11 @ 15 @ 25c
Umber, Burnt.......4 @ 8c
" " in oil.......9 @ 12 @ 16c
" Raw.......3½ @ 7½c
" " in oil.......10 @ 16 @ 18c
Vermillion, Chinese.......90c, gold
" English.......60c, gold
" Trieste.......1.10, gold
" American, Common.......18c
White Lead, American, pure dry.......8c
" " " " in oil.......8½c
White, Paris, English, prime.......in bbls. 2 @ 2½c
Yellow Ochre, French.......$1.75
" " " in oil...asst'd cans, 11c; kegs, 8c
" " Vermont.......in casks 1½c
Yellow Chrome.......17 @ 27c
" " in oil.......14 @ 18 @ 25c
Zinc White, American No. 1, dry.......8½c
" " No. 1, in oil.......11c
" French (Paris).......11c
" " in oil.......10½ @ 11½c

Oils.
Linseed, Raw, in casks and bbls.......⅌ gal. 62c @ 63c
" Boiled, " " ....67c @ 68c
Whale, Crude.......bbl. 62c @ 65c
" Bleached Winter.......bbl, 70c
" Unbleached.......bbl, 65c
Cotton Seed, Crude.......bbl, 50c
" Southern Yellow.......bbl, 55c
" White.......bbl, 60c
Neatsfoot, Winter.......70c @ $1.10
Natural Lubricating.......36c @ 38c

Sundries.
Asphaltum.......9c
Benzine.......⅌ gal. 16c
Chalk.......[illegible]
" Block.......[illegible]
Dryer, Patent, Am'n.......asst'd cans, 10½c; keg, 9c
Frostings.......[illegible]
Glue, White.......33 @ 44c
" Sheet.......20c
Glaziers' Points, Zinc.......30c
Gum, Copal.......36c
" Damar.......25c
" Shellac, English.......30c
" " dark.......25c
Litharge, Englisgh.......9c gold
Pumice Stone, selected Lumps.......4 @ 6c
" powdered.......2½c
Putty, in bladders.......2½c
" in bulk.......2c
Rotten Stone, soft, English.......8c
Spirits Turpentine.......33c
Whiting Spanish.......¾c

Glass.
FRENCH WINDOW GLASS.
Prices current per box of 50 feet.
Single Thick.—discount 60 %

SIZES.	1st.	2d.	3d.	4th
6 x 8 to 10 x 15	$ 7.50	$ 6.75	$ 6.25	$ 5.75
11 x 14 to 16 x 24	8.50	7.75	7.25	6.50
13 x 22 to 20 x 30	10.75	9.75	8.75	[illegible]
15 x 36 to 24 x 30	12.25	10.75	9.00	
26 x 28 to 24 x 36	13.00	11.50	9.75	
26 x 37 to 26 x 44	14.50	13.25	10.75	
26 x 46 to 30 x 50	15.00	14.00	11.25	
30 x 52 to 30 x 54	16.00	14.50	12.00	
30 x 56 to 34 x 56	17.25	15.50	13.50	
34 x 58 to 34 x 60	18.25	17.25	15.00	
36 x 60 to 40 x 60	20.75	18.75	17.25	

Double Thick.—Discount 60&10 %

SIZES.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15	$12.00	$11.00	$10.00	$ 9.[illegible]
11 x 14 to 16 x 24	13.75	12.50	11.75	10.[illegible]
18 x 22 to 20 x 30	17.25	15.75	14.00	
15 x 36 to 24 x 30	19.75	17.25	14.50	
26 x 28 to 24 x 36	21.00	18.50	15.75	
26 x 36 to 26 x 44	23.25	21.25	17.25	
26 x 46 to 30 x 50	24.00	22.50	18.00	
30 x 52 to 30 x 54	25.75	23.25	19.25	
30 x 56 to 34 x 56	27.75	25.00	21.75	
34 x 58 to 34 x 60	29.25	27.75	24.00	
36 x 60 to 40 x 60	33.25	30.00	27.75	

Sizes above 40 x 60—$10.00 per box extra for every five inches.
An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket.

Steel.

R. H. WOLFF & CO.,

IMPORTERS OF

IRON AND STEEL.

Sole Agents for the Sale of the Celebrated

Pr. HOMOGENEOUS DEC.' CAST STEEL, GUN BARRELS, MOULDS AND ORDNANCE.

Sole Agents for **COCKER BROTHERS,** Limited,

Successors to SAML. COCKER & SON, (ESTABLISHED 1752.)

SHEFFIELD, ENGLAND.

Sole manufacturers of

"SC" **EXTRA" Cast Steel,**

AND

CAST STEEL WIRE for all purposes.

Sole Makers of

Cocker's "Meteor" Wire Plates.

Railroad Supplies and General Merchants.

Office and Warehouse, 46 Cliff Street, New York.

F. W. MOSS,

Successor to JOSHUA MOSS & GAMBLE BROS.

FRANKLIN WORKS, WADSLEY BRIDGE WORKS, WALKLEY WORKS, } SHEFFIELD, ENGLAND.

STEEL AND FILES.

Principal Depots: 80 John St., N. Y., and 512 Commerce St., Phila.

MOSS & GAMBLE **SUPERIOR C. S. "FULL WEIGHT" FILES,**

Cast Steel Hammers and Sledges. Also, "M. & G." Anvils and Vises.

WARRANTED CAST STEEL, especially adapted for DIES and TURNING TOOLS, DRILLS, COLD CHISELS, PUNCHES and all kinds of MACHINISTS' TOOLS.
Celebrated Improved Mild Centre Cast Steel, for Taps, Reamers, and Milling Tools, warranted not to crack in hardening Taps of any size.
Swede Spring Steel, especially adapted to Locomotive and Railway Car Springs.
English Spring and Plow Plate Steel.

Sheet Cast Steel Shear, German, Round Machinery, Hammer, Fork and Shovel Steel

GENERAL MERCHANT.

Isaac Jenks & Sons,

MINERVA AND BEAVER WORKS, WOLVERHAMPTON, ENGLAND.

MANUFACTURERS OF

"JENKS" SPRING STEEL, "MINERVA" SWEDES, AND "ANGLO" CAST SPRING STEEL

"JENKS" TIRE, TOE CORK, SLEIGH SHOE, BLISTER, AND PLOW STEEL;

ALSO,

"BEAVER" PLOW, TIRE, AXE, AND SHEET IRON.

ISAAC JENKS, Jr., Representative, 245 Pearl and 20 Cliff Streets, N. Y.

FRANCIS HOBSON & SON,

97 John Street, NEW YORK,

Sole Manufact'rs of "CHOICE" Extra Cast Steel.

Manufacturers of all Descriptions of Steel.

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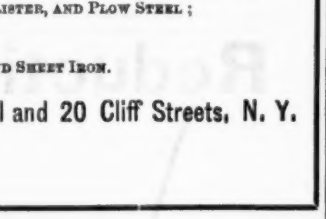

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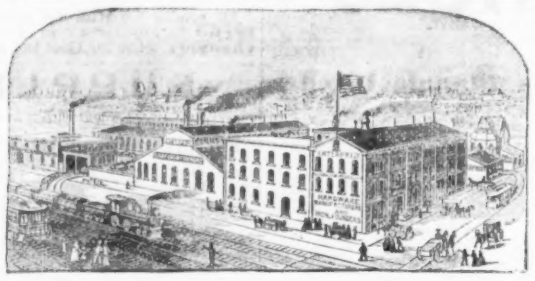

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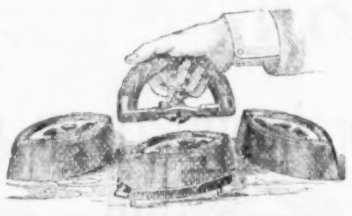

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Because they have 40 Brass Tumblers, independent in their action, either one of which will prevent the cock from being opened unless brought to proper position by the Key.

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Because we use no Springs to break or get out of place.

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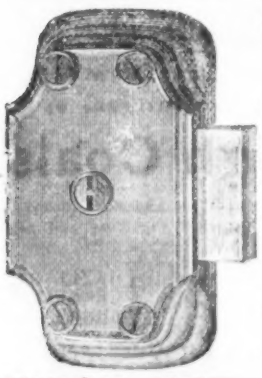

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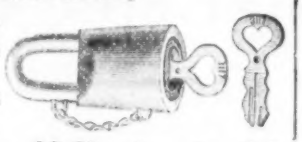

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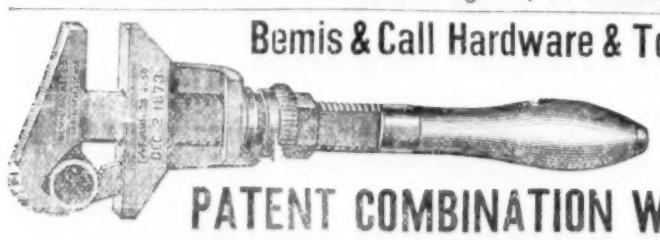

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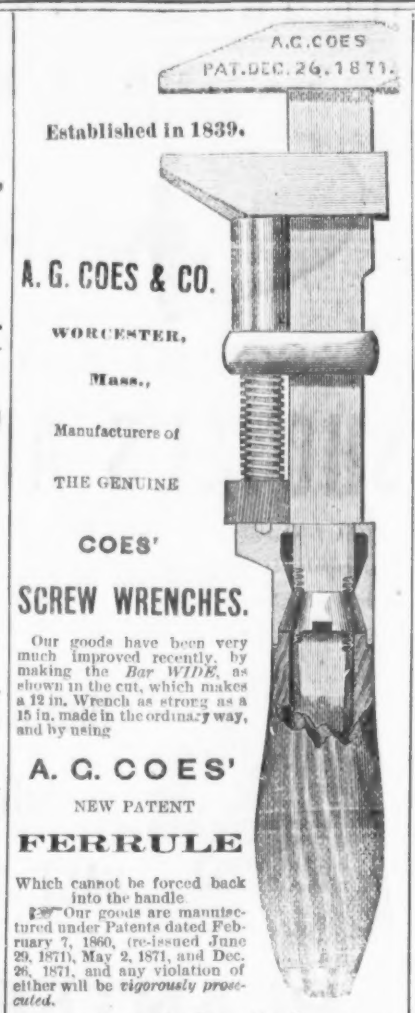

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Which cannot be forced back into the handle.

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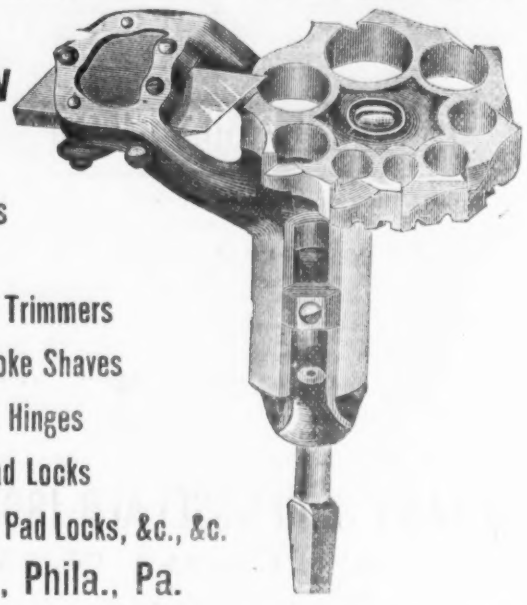

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Adjustable Gate Hinges
Scandinavian Pad Locks
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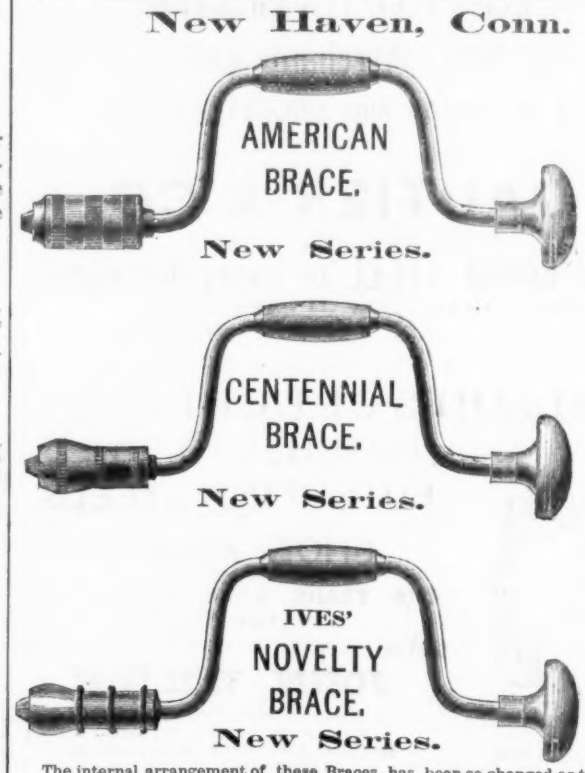

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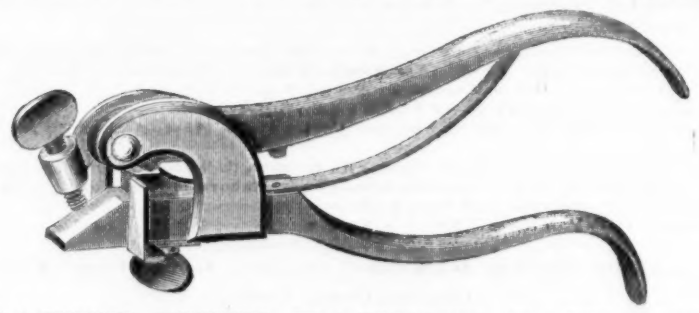

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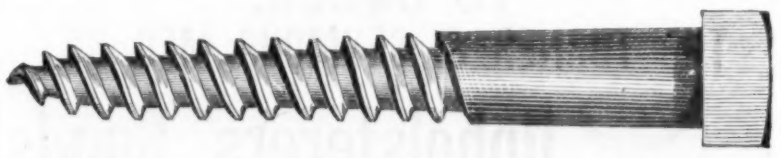
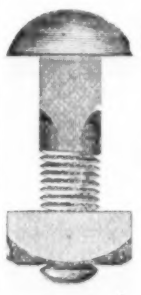


WM. H. HASKELL & CO.

Pawtucket, R. I.,

MANUFACTURERS OF



COACH SCREWS

(With Gimlet Points),

ALL KINDS OF

Machine and Plow Bolts,

FORGED SET SCREWS,

AND

TAP BOLTS.

HENRY B. NEWHALL 11 WARREN ST. N NEW YORK AGENT

PHILADELPHIA.

(Corrected weekly by Lloyd, Supplee & Walton).

Terms, 30 days. For 60 or 90 days, interest added at 10 per cent. per annum.

Anvils.—
Peter Wright's, ℘ ℔, gold ... 10¼c
over 250 lbs ... 11c. gold, net
Wilkinson's, ℘ ℔, gold ... 11c. net
Eagle (American) ... 9 cents per lb—dis 20%

Apple Parers.—
Reading No. 72 ... per doz $ 5 50 net
" " 75 ... " 6 25 net
" " 76 ... " 7 00 net
" " 77 ... " 7 50 net
Peach Parers ... " 10 00 net
Little Favorite, corer and slicer ... " 7 50 net
Lots of 10 to 25 dozen special price.

Axes.—
Mann's Red Warrior ... Per doz. $8 50 @ 9 00 net
Red Indian ... " 8 50 @ 9 00 net
Red Chieftain, bevelled ... " 9 00 @ 10 00 net
Crown Prince ... " 9 50 @ 10 50 net

Augers and Auger Bits.—
Bates' Nut Augers ... dis 40&10 @ 50 %
Cook's Augers ... dis 50 @ 50&5 %
Watrous' Ship Augers ... dis 15 %
Benjamin Pierce Auger Bitts ... dis 40 %
Griswold Auger Bits ... dis 40&10 @ 50 %
Cook's " " ... dis 50 @ 50&5 %
Jennings' " " ... dis 10&10 %
Bonney's Pat. Hol. Augers, list $48 ℘ doz ... dis 25&10 %
Stearns' Pat. Hol. Augers " $48 " ... dis 25&10 %

Balances.—
Light and "Common" ... dis 25&10 %
All other Spring Balances ... dis 25 %

Bells.—
Bevin Bros. Mfg Co. Light Hand Bells ... dis 70 @ 75 %
Swiss Pattern Hand Bells ... dis 50 @ 50&10 %
Connell's Door Bells ... dis 50 @ 50&10 %
Gt. Western & Kentucky Cow, new list ... dis 50 %

Boring Machines.—
Upright, with Augers ... List $9 00 dis 40&10 %
" without Augers ... " 5 50 dis 40&10 %
Angular, with Augers ... " 11 00 dis 40&10 %
" without Augers ... " 7 00 dis 40&10 %

Bolts.—Eastern Carriage Bolts ... dis 75&37 %—cash
Philadelphia " " ... dis 60&10 @ 60&20 %
Stanley, Wrought Shutter ... dis 50 %

Braces.—Barber's ... dis 40&5 %
Backus ... dis 50 @ 50&10 %
Spofford ... dis 50 %
American Ball ... dis 25&10 %

Butts.—Cast Fast Joint, Narrow ... dis 60&10 %
" " " Broad ... dis 65&10 %
Cast Loose Joint, Narrow ... dis 70&10 %
" " " Broad ... 70&10 %
" Acorn, Loose Pin ... dis 65&10 %
" Acorn " Jap'd ... dis 67½&10 %
Mayer's Loose Joint ... dis 70&10 %
Wrought Loose Pin ... dis 40&10 %
" Table Hinges and Back Flaps ... dis 35&10 %
" Narrow, Fast ... dis 40&10 %
" Loose Joint ... dis 40&10

Blind Butts.
Parker ... dis 60 @ 60&10 %
Clark ... dis 60 %
Shepard ... dis 60 %
Lull & Porter ... dis 66⅔&10 %
Huffer's ... dis 33⅓ @ 33⅓&10 %

Chains.—German Halter and Coil ... dis 30&5 % gold
Galvanized Pump ... ℘ ℔ 10½c net
Best Proof Coil Chain—(English).

℘ ℔ ...	11½	8¾	7¾	7½	8½	8¼	7c gold
	3-16	¼	5-16	⅜	7-16	½	⅝ in.

Chisels.—Socket Framing ... dis 65, 5&10 %
Socket Firmer ... dis 65, 5&10 %
Butcher's ... $5 00 to £ gold

Casters.—Bed ... dis 50&10 %
Plate ... dis 50&10 %

Coffee Mills.—Box and Side ... dis 25 %
Enterprise ... dis 20 %

Cutlery.—Walden Pocket ... dis 30 @ 35 %
Landers, Frary & Clark, J. Russell & Co., Lamson & Goodnow Mfg. Co. and Meriden Cutlery Co., Manufacturers' prices net

Drawing Knives.—
Hart Mfg. Co.'s ... dis 65, 5&10 %
Adjustable Handle ... dis 20 %

Fry Pans.
Tinned ... dis 50&10 @ 60 %

℘ doz.	$3·50	4·00	4·50	5·00	5·50	6·50	7·50	9·00	10·00
No.	0	1	2	3	4	5	6	7	8

Burnished ... dis 50&10 @ 60 %

℘ doz.	$3·00	3·75	4·25	4·75	5·25	6·00	7·00	8·00	9·00
No.	0	1	2	3	4	5	6	7	8

Files.
Nicholson ... dis 35 %
Disston ... dis 35 %
Butcher ... $1 50 £ gold
Spencer ... $1 50 @ 4 75 £ gold

Fluting Machines.
Imperial—4½ in. roll ... each $2 50 net
" —6 in. roll ... " 3 00 net
Crown—4½ in. roll ... each 2 35 dis 10 %
" —6 in. roll ... " 2 75 dis 10 %
" —8 in. roll ... " 4 25 dis 10 %
Eagle—3½ in. roll ... per doz. $18 00 dis 10 %
" —5½ in. roll ... per doz. 24 00 dis 10 %
Geneva Fluter ... per doz. 15 00 net
Favorite com. Fluter & Sad-iron ... ℘ doz $20 dis 25&10 %

Hammers.
Yerkes & Plumb's ... dis 25 @ 30 %
Hammond & Son's ... dis 25 @ 30 %

Hatchets.
Yerkes & Plumb ... dis 25 @ 30 %
Hammond ... dis 25 @ 30 %
Hunt ... dis 25 %

Hinges.
Strap and T ... dis 60 @ 60&5 %

Horse Nails.

	Nos. 5	6	7	8	9	10
Ausable	30	27	25	24	23	22
" Polished & P't'd and Blued and Pointed	31	28	26	25	24	23
Globe ... Net list	26	23	21	20	19	18
Clinton	22	20	19	18	17	
" Polished and Pointed	28	21	20	19	18	

Southern, all sizes ... ℘ ℔ 14c. net
Discount on Ausable and Clinton, 20 %; Globe, net.

Locks and Knobs.
Branford ... new list, dis 60&10&2 % cash
Gaylord Cabinet ... dis 25&2 % cash
United States Lock Co ... dis 35 %
American Padlocks ... dis 33⅓, 5&2 % cash
Scandinavian Pad Locks.

℘ doz.	$5·00	5·50	6·50	7·50	8·50	10·00	12·50	dis 50 %
No.	57	58	59	60	61	62	63	
℘ doz.		$18·00		26·00		38·00		dis 50 %
No.		64		65		66		

Lanterns.—
Square Candle and Oil ... ℘ doz. $2 75 @ 3 00
Tubular ... No. 0, $10·50; No. 1, 12·50 ℘ doz. net
Guards. 50 cents extra per doz. net.

Mattocks.—
Long and Short Cutter ... ℘ doz. $9 00 @ 9 50 net
Pennsylvania Pattern ... " 9 50 @ 10 00 net

Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets ... dis 20 %
Stebbins' Gates ... dis 62½&10 %
Lincoln's " ... dis 62½&10 %
Landers, Frary & Clark's Petroleum ... dis 20&10 %
Brass Liquor Cocks ... dis 5 %
Cork Lined " ... dis 65 @ 65&10 %

Meat Cutters.—Dixon's ... dis 25 @ 30 %
Woodruff ... dis 25 @ 30 %
Stowe ... dis 25 @ 30 %
Hale's ... new list, dis 50&2 %
American ... dis 25 %
Stuffers ... dis 25 @ 30 %
Enterprise Stuffers ... dis 20 %

Planes.—Sandusky ... dis 35 %
Ogontz ... dis 30&10 %
Bailey ... dis 25&10 %

Plane Irons.—Sandusky ... dis 10&10 %
Butcher's ... gold £, $5 50

Plumbs and Levels.
Stanley's Adjustable ... dis 60&10 %
" Non-Adjustable ... dis 60&10 %

Picks.—Philadelphia ... dis 30 %
Hunt's ... dis 25 %

Rules—Stanley Boxwood ... dis 60&10 %
Stanley Ivory ... dis 50&10 %

Steelyards.—Hart's Pattern ... dis 60&10 %

℘ doz.	$14·50	17·75	21·00	26·50	31·00	35·50
Lbs.	50	100	150	200	250	300

American Pattern ... dis 25 @ 25&10 %

℘ doz.	$5·50	7·00	9·00	10·00	11·00	12·00
Lbs.	50	100	150	200	250	300

English Pattern ... dis 20 @ 25 %

℘ doz.	$7·00	8·67	10·67	12·67	14·67	16·67
Lbs.	50	100	150	200	250	300

Squares.—
Steel and Iron ... dis 50 %; full case, dis 50&10 %
Try Squares, Stanley ... dis 45&10 %
Disston's Try Squares ... dis 45 %

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened ... ℘ doz. $9 00 net
Clipper No. 10, Bronze Blade Boxed and Sharpened ... ℘ doz. $8·50 net
Clipper No. 5, Painted Red, Boxed and Sharpened ... ℘ doz $8·25 net

Saws—Disston's Hand, Panel and Rip ... dis 20 %
Disston's Circular ... dis 30 %
" Cross-Cut No. 2, Plain Tooth ... ℘ ft., 45c. net
" " Patent Tooth ... ℘ ft., 45c. net
" " Champion Tooth ... ℘ ft., 35c. net

Shovels and Spades.
Rowland ... dis 50&5 %
Oliver Ames & Sons, new list ... dis 30 %

Sad Irons.—4 to 10 lbs ... ℘ ℔, 2¼ @ 2½c
Mrs. Potts' Patent ... dis 30 @ 40 %

Stone.—Arkansas Oil Stone ... ℘ ℔ $2·00 net
Washita Extra ... " 35c net
" No. 1 ... " 30c net
" " 2 ... " 25c net
" Slips ... " 60c net
" Axe ... " 25c net
Turkey Oil Stone No. 1 ... " 16½c net
" " " 2 ... " 16c net
" Axe Stone ... " 25c net
Hindostan Oil Stone No. 1 ... ℘ ℔ 4 @ 4½c net
" Axe Stone ... " 5 @ 5½c net

Screws.
United States and others in Combination ... dis 60 %

Spoons.—
Plated ... dis 40 @ 40&5 %
German Silver ... dis 30&5 %
Britannia, Boardmans ... dis 50&10 %
" Parkers ... dis 50&10 %
Tinned ... dis 15 @ 20 %
" by case ... dis 20 %

Springs—Torrey ... ℘ doz $2 00 @ 2·10 net
Philadelphia ... 5 in., $5·00; 8 in., $7·00 ℘ doz. dis 25 %
Chatfield ... No. 1, $3·50; 2, $4·00; 3, $6 00 ℘ doz. net
Gem Coil No. 1, Large Jap'd ... ℘ doz $3·50 } dis
" " No. 2, Medium Jap'd ... " 2·50 }
" " No. 3, Small ... " 2·00 }

Stocks and Dies. ... dis 10&5 %

Stove Polish.—Gem ... ℘ gross, $4·50, dis 5 %
Dixon ... " $6 00, dis 5 %
Onyx ... " $4·00 @ 4·25 net

Tacks, Brads, &c.
Tacks, Half Weight American ... dis 75 %
" Full " " ... dis 50 %
" Half " Swedes ... dis 65 %
" Full " " ... dis 30 %
" Carpet, Am. and Swedes ... dis 20 %
" " Leather Head ... net
" Copper ... ℘ ℔ 58c, net
(Extra 20@40 %)
Brads, Half Weight ... dis 50 %
Shoe Nails—
4-8 and larger, 9c; 3½-8, 9½c ℘ ℔, dis 20&10 %
Trunk, Clout and Finishing Nails—

⅛	3-16	¼	5-16	1	1⅛ and over
25,	20,	17,	15,	13,	11c ℘ ℔, dis 20&10%

Double Pointed Tacks ... dis 40&5 %

Traps.
Genuine Oneida—Newhouse ... dis 30 %
Im. Oneida—Newhouse list (1st qual.) ... dis 60 %

Vises.—Solid Box, Trenton ... ℘ ℔ 11½ @ 12½c net

Wrenches.—
Girard (Coe's Pattern) ... dis 50&10 %, case 50, 10&5 %
Agricultural—
℘ doz 10 in., $3 60; 12 in., $5 40 net; case dis 5 %
Coes' Genuine ... dis 50&10 %
" Pat. Wrot Bar ... dis 60&10 %
" " Mall " ... dis 75&10 %
Taft's " Wrot " ... dis 75 @ 75&10 %
Phila. Tool Co., Duplex ... dis 25 %

Wire.—
Bright or Ann'd, No. 0 to 18 ... dis 57½ @ 60 %
" " No. 19 to 26 ... dis 60 @ 62½ %
" " No. 27 to 36 ... dis 62½ @ 65 %
Coppered 0 to 18 ... dis 52½ @ 50 %
Tinned Broom Wire ... dis 45 @ 47½ %
Galvanized, No. 7 to 18 ... Market list, dis 30 @ 35 %

Wringers.—Novelty No. 10 ... ℘ doz. $60 00 net
Novelty No. 2 ... " 63·00 net
Universal, No. 2½ ... " 60·00 net
" No 3 ... " 63·00 net

PITTSBURGH.

Merchant Iron.

Flat Bar.

1½ to 4¾ x ¾ to 1 in ... 1.80c	1¼ and 1⅜x⅜ to ¾ in ... 1.90c
4¼ to 6 x ⅜ to 1 in ... 1.90c	1 and 1⅛x⅜ to ¾ in ... 2c
1¾ to 6x1⅛ to 1⅞ in ... 2.20c	⅝, ¾ and ⅞x⅜ to ⅝ in ... 2.20c
Rounds and Squares.	⅝ to 9-16 in ... 2c
1 to 1⅞ in ... 1.80c	½ to 7-16 in ... 2.20c
2 to 2⅝ in ... 2c	⅜ in ... 2.40c
2¾ to 3¼ in ... 2.30c	5-16 in ... 2.60c
3⅜ to 4 in ... 2.80c	¼ in ... 2.80c
¾ to ⅞ in ... 1.90c	3-16 in ... 4.80c

Horse Shoe Bar—all sizes ... 2.80c

Heavy Bands.	1 to 1⅜x¼ and 5-16 ... 2.10c
3½ to 6x¼ and 5-16 in. 2c	¾ to ⅞x¼ and 5-16 ... 2.30c
1½ to 3¼x¼ & 5-16 in. 2c	⅝ & ½x¼ and 5-16 ... 2.80c
Light Bands.	1 to 1⅜x⅛ to 3-16 ... 2.50c
3 to 6x⅛ to 3-16 in ... 2.10c	¾ and ⅞x⅛ to 3-16 in ... 2.80c
1½ to 2¾x⅛ to 3-16 in ... 2.30c	⅝ and ½x⅛ to 3-16 in ... 3.30c

Same sizes X No. 11 and No. 12 2-10c. extra.

Hoop Iron.	⅝ & 9-16, Nos. 17 to 20 ... 4.80c
⅝ & 9-16, Nos. 13 to 16 ... 4.50c	¾ & 11-16, Nos. 17 to 20 ... 4.30c
¾&11-16, Nos. 13 to 16 ... 4c	⅞ & 13-16, Nos. 17 to 20 ... 3.80c
⅞&13-16, Nos. 13 to 16 ... 3.50c	1 and 1⅛, Nos. 16 to 19 ... 3.40c
1 & 1⅛, Nos. 13 to 15 ... 3.10c	1¼ to 2, Nos. 16 to 18 ... 2.90c
1¼ to 2, Nos. 13 to 15 ... 2.70c	2¼ to 3½, Nos. 13 to 15 ... 2.80c

The prices under Hoop Iron do not apply to Cotton Ties.

1-10c ℘ ℔ extra for each gauge lighter.

Oval Iron.

⅞ to 1¼ in ... 2.20c	½ in ... 2.60c
⅝ to ¾ in ... 2.40c	⅜ in ... 3c
Half Oval & Half Round	½ in ... 3.30c
⅞ to 1¼ in ... 2.50c	⅜ in ... 4.80c
⅝ to ¾ in ... 3c	W'g'n Box Iron, ¾&⅞ ... 3.30c

Sheet Iron.

	Com'n.	Charc'l		Com'n.	Charc'l
No. 10 to 14	2.60c	4.10c	No. 22 to 24	3.30c	4.80c
No. 15 to 17	2.80c	4.30c	No. 25 & 26	3.50c	5c
No. 18 to 21	3.10c	4.60c	No. 27	3.70c	5.20c
			No. 28	4.10c	5.60c

All Sheets, No. 18 and lighter, over 30 in. wide, not less than 2-10c. extra.

Wood's Patent Planished Sheet.

1st quality (A) ... 11c | 2d quality (B) ... 9½c

Plate Iron—3-16 to ½ in. thick ... 2.60c

Galvanized Iron-Juniata.

Nos. 14 to 20 ... 12c	No. 27 ... 15c
Nos. 21 to 24 ... 13c	No. 28 ... 16c
Nos. 25 and 26 ... 14c	No. 29 ... 18c

Common and imperfect Juniata, 45 to 50 % off. Discount, 30 to 40 %.

Roofing Iron, Corrugated or Crimped.

Galvanized Common.	Black.
No. 20 ... 7c, net cash	No. 20 ... 4c
No. 21 to 24 ... 7½&8c, "	Nos. 21 to 24 ... 4¼c

Bridge Iron.

Carnegie Bros. & Co.'s list.

Beams and Channels.

Solid Wrought Iron Beams, 3 to 10½ in. x 30 ft. ℘ ℔ 3 c
" " " " 12 in. by 25 ft ... " 3
" " " " 15 in. by 25 ft ... " 3¼c
Deck Beams, 7 to 9 in. by 30 ft ... " 3 c
Channel Bars, 1½ to 10 in. by 30 ft ... " 3 c
" " 12 in by 30 ft ... " 3¼c

Tee Iron.

1 in. x 1 in. to 5 in. x 3 in ... ℘ ℔ 2.9c

Angle Iron.

Equal Sided, 1x1 to 1¾x1¾ in ... ℘ ℔ 2.7c
" " 2x2 to 4x4 ... " 2.6c
Unequal Sided, 2x1¼ to 5x4 ... " 2.6c
Square Root Angles, 2x2 to 3½x3½ ... " 2.6c
Star Iron, 1½x1½ to 4x4 ... " 2.7c
Sash Iron, 1¾x⅞x3-16 ... " 3.25c
Miscellaneous Shapes, various shapes ... ℘ ℔, 2.6 to 3.5c

Nails.

Fence and Brads.

10d to 60d ... $2.50	4d and 5d ... $3.25
8d and 9d ... 2.75	3d ... 4.00
6d and 7d ... 3.00	2d ... 5.25
Barrel.	1⅛ in ... 4.25
¾ in ... 6.50	1¼ " ... 4.00
⅞ " ... 5.50	1⅜ " ... 3.50
1 " ... 5.00	1½ " ... 3.25
Lining.	
⅞ in ... 7.00	¾ in ... 8.50
Tobacco Hhd.	8d ... 3.25
10d ... 3.00	6d and 7d ... 3.50

Clinch—All sizes ... 4.25

Slating.

5d ... 3.50	3d ... 4.25
4d ... 3.50	2d ... 5.50
Finishing.	1½ to 1¾ in ... 4.50
1 in ... 7.50	2 in ... 4.25
1¼ " ... 6.50	2½ " ... 4.00
1⅜ " ... 4.75	3 " and over ... 3.75
Casing and Box.	6d ... 3.75
10d to 30d ... 3.25	4d ... 4.00
8d ... 3.50	3d ... 5.00
Fine Blued.	3d ... 5.50
4d ... 4.25	2d ... 6.25

Cut Spikes—All sizes ... 2.75
Boat Spikes—All sizes ... 3.25
Each half keg 10 cents extra.

Terms.—Note or acceptance at 60 days; or a discount of 2 per cent. for cash, if remitted within 10 days from date of invoice. An abatement of 10 cents per keg allowed upon orders of 200 kegs or over.

Steel.

Square, Flat and Octagon Tool Steel.

⅜ to 2 in ... 13c	7-32 and 4⅛ 5 in ... 16c
5-16 and 2⅛ to 3 in ... 14c	3-16 and 5⅛ to 6 in ... 19c
¼ and 3⅛ to 4 in ... 15c	5-32 in ... 24c

Single and Double Shear Nailers—Same as Tool.
Knife, Tap, Die, Mill Pick, Drill—Ordinary sizes ... 13c

Machinery Steel—Round.

⅜ to 2 in ... 7½c	7-32 and 4⅛ to 5 in ... 10½c
5-16 and 2⅛ to 3 in ... 8½c	3-16 and 5⅛ to 6 in ... 13½c
¼ and 3⅛ to 4 in ... 9½c	5-32 in ... 18½c
Cast Spring Steel.	1⅛ to 3x5-32 to 3-16 in ... 7½c
1 to 4x¼ to ½ in ... 6½c	⅞ to 1⅛x5-32 to 3-16 in ... 8½c

Agricultural Steels.

Solid Cast Steel Plow, 4 to 16 by 3-16 to ⅜ in ... 7c
"Iron Center Plow," 4 to 16x3-16 to ⅜ in ... 8c
"Iron Back Plow," 4 to 16x3-16 to ⅜ in ... 8½c
Soft Steel Center Plow, 4 to 16x3-16 to ⅜ in ... 9c
Landside and Cultivator, C. S., ⅜ in. thick ... 9½c
Circular Plow Coulters, 5-32 to ¼ in. thick ... 11c
Reaper and Scythe ... 13c
Fork and Hoe ... 7c
Horse Rake Teeth, to length ... 8c
Finger Bar ... 8½c
Cutter Bars, C. S ... 8½c
" " German Spring Steel ... 7½c
Cornstalk Cutter beveled to length ... 8c
Planters' Hoe, C. S ... 9c
Hoe, C. S ... 7½c

Sheet Steels.

German, 10 to 16 g ... 8c	Common C'st, 17 to 20 g ... 10c
" 17 to 20 g ... 11c	Best Cast, 10 to 16 g ... 13c
Common C'st, 10 to 16 g. 9c	" " 17 to 20 g ... 14c

Rolls and Castings.

Furnace, Floor and Straightening Plates ... 1¾ @ 2c
Housings and Castings not otherwise specified ... 2½c
Guide Plates ... 3 c
Spindles and coupling boxes ... 2 @ 2½c
Sand Rolls and Pinions, large size ... 2½c
" " " small size ... 3 c
Pipe Mill Castings ... 4 c
Rolling Mill Castings under 50 lbs ... 3 c
Spur and Bevel Wheels, large ... 3 @ 3½c
" " small ... 4 @ 4½c
Pulleys up to 30 inches ... 4 c
" over 30 inches ... 3¼ @ 3½c
Engine Castings, light ... 3¾c
" " heavy ... 3¼c

Chilled Rolls.

6 to 7 in. diam., 7 to 20 in. long ... 6 c
8 to 15 in. " 8 to 40 in. " ... 5 c
15 to 24 in. " 15 to 72 in. " ... 4 c
24 to 31 in. " 72 to 108 in. " ... 4½c

Heavy Hardware.
Bolts, Screws, Nuts, etc.

Lewis, Oliver & Phillips, discount off Standard List.
Carriage & Tire Bolts, ordinary orders ... 75, & 3 % off net
Stove Bolts ... 40&5 % off net
Elevator Bolts ... 30 % off net
Machine and Square Head Bolts ... 60&10 % off net
Coach and Lag Screws ... 60&10 % off net
Bolt Ends ... 60&10 % off net
Pat. Hot Pressed Sq. and Hex. Nuts ... 8c ℘ ℔ off net
Washers, all made from new band iron ... 8c ℘ ℔ off net
Nuts and Washers in 25 ℔ boxes, ½c ℘ ℔ ex. Nuts and Washers in lots less than one keg each size, ½c ℘ ℔ ex. Nuts and Washers in 5 ℔ boxes, 1c ℘ ℔ ex.
Strap and T Hinges ... 60&12½ % off net
Harrow Teeth ... net
Skein Bolts ... net
Cast Iron Washers ... 3¼c ℘ ℔ net
Fire Shovels and Pokers ... 50 % off

Wagon Hardware.

Single Trees, Neck Yokes and Double Trees, made from best selected hickory, and ironed complete, in the most approved patterns.
No. 1 Southern Plow Single Tree, Ironed complete, Irons all Wrought ... each, 25c net
No. 2 Western Plow Single Tree, Ironed complete, Irons all Wrought ... each, 35c net
No. 3 Wagon Single Tree, Iron complete, Irons all Wrought, except Malleable Ferrule ... each, 50c net
No. 4 Wagon Single Tree, Ironed complete, Irons all Wrought; Improved End Pieces riveted on; one side acts as a wear iron for wheel to rub against ... each, 50c net
Neck Yoke, Ironed complete, Irons all Wrought except End Ferrules, with Wt. Iron Rings ... each, 60c net
Southern Plow Double Tree, Ironed complete, Irons all Wrought ... each, 50c net
Wagon Box Strap Bolts—
For orders of 100 Set, 45&10 % dis.

10 in. long by 7-16 at Screw End, ℘ set of 8 bolts .. 45c					
12 in.	"	½	"	8 "	.. 55c
10 in.	"	9-16	"	8 "	.. 65c
12 in.	"	9-16	"	8 "	.. 70c
14 in.	"	9-16	"	8 "	.. 80c
10 in.	"	⅝	"	8 "	.. 80c
12 in.	"	⅝	"	8 "	.. 80c
14 in.	"	⅝	"	8 "	.. 90c
16 in.	"	⅝	"	8 "	.. 1.00
18 in.	"	⅝	"	8 "	.. 1.10
20 in.	"	⅝	"	8 "	.. 1.20

5c ℘ set for each additional inch over 14 inches. All lengths made.

Chains, Straight or Twist Link.

5-16 ... 7¾c	½ ... 7c
⅜ ... 7¼c	9-16 ... 6½c
7-16 ... 7¼c	⅝ ... 5½c

Net cash, 30 days.

Horse Shoes, Etc.

Juniata Horse Shoes ... per keg, $3.80
" Mule " ... " 4.80
In 100 keg lots.
Snow, Mud and Trotting Shoes ... " 4.50
Steel Toe Calks ... per lb. 7½c
Thistlewood & Co.'s Self-Sharpening Horse Shoes ... per keg, $5.25
Thistlewood & Co.'s Self-Sharpening Snow Shoes ... " 5.50
Toe Calks ... per lb. 8c

White and Red Lead.

Assorted Kegs (all sizes) ... 8c
25 ℔ Tin Pails, 100 ℔ Cases ... 8½c
12½ ℔ Tin " " ... 9c
Red Lead ... in kegs, 7¾c; in barrels, 7½c.
Orange Mineral ... " 10c; " 9¾c.
Litharge ... " 7¾c; " 7½c.
Dry White Lead ... " 7¾c; " 7½c.

Window Glass.

Per Box of 50 Feet.—Discount 70 % @ 70&10 %.

Single Strength.

Size.	AA.	A.	B.	C.
6 x 8 to 10 x 15	$7.50	$6.75	$6.25	$5.7
11 x 14 to 16 x 24	8.50	7.75	7.25	6.5
18 x 22 to 20 x 30	10.75	9.75	8.75	7.7
15 x 36 to 24 x 30	12.25	10.75	9.00	
26 x 28 to 24 x 36	13.00	11.50	9.75	
26 x 36 to 26 x 44	14.50	13.25	10.75	
26 x 46 to 30 x 50	15.00	14.00	11.25	
30 x 52 to 30 x 54				
30 x 56 to 34 x 56				
34 x 58 to 34 x 60				
36 x 60 to 40 x 60				
Double Strength.				
6 x 8 to 10 x 15	12.00	11.00	10.00	25
11 x 14 to 16 x 24	13.75	12.50	11.75	10.50
18 x 22 to 20 x 30	17.25	15.75	14.00	
15 x 36 to 24 x 30	19.75	17.25	14.50	
26 x 28 to 24 x 36	21.00	18.50	15.75	
26 x 36 to 26 x 44	23.25	21.25	17.25	
26 x 46 to 30 x 50	24.00	22.50	18.00	
30 x 52 to 30 x 54	25.75	23.25	19.25	
30 x 56 to 34 x 56	27.75	25.00	21.75	
34 x 58 to 34 x 60	29.25	27.75	24.00	
36 x 60 to 40 x 60	33.25	30.00	27.75	

An additional 10 per cent. will be charged for all glass more than 40 inches wide. All sizes above 52 inches in length and not making more than 81 united inches, will be charged in the 84 united inches bracket.

CHICAGO.

(The Chicago Stamping Co., 72, 74 & 76 Lake St.)
Jan. 16, 1878.

Tin Plate.—

10x14, IC, Ch'l, Good $	14x20, IXX. Ch' Best. 12 25
10x14, IC, " Best. 7 25	14x20, IXXX. " " . 14 75
10x14 IX, " " . 9 75	DC, 100 Plate " " . 7 25
12x12, IC. " " 7 25	DX. " . 9 75
12x12, IX, " " . 9 75	DXX. " " . 12 25
14x20, IC, " " . 7 25	DXXX. " " . 14 75
14x20, IX. " " . 9 75	IC, Roofing, " " . 6 75
	IX, " " " . 9 25

20x28, IC, Charcoal Roofing, Good ...
20x28, IC, " Best ... 14 00
20x28, IX, " ... 18 50
10x14, IC, Coke Plates ... 6 50
14x20, IC, " ... 6 75
10x20, IC, " ... 10 75

Block Tin.—
Large Pigs ... 20c | Bars ... 22c
Small ... 21c

Zinc.—Sheet, 500 to 1000 ℔. Casks ... 7¼c
Loose Sheets ... 8 c
Slab Zinc or Spelter ... 7 c

Copper.—Bottoms ... 30c
Sheathing ... 28c
Planished ... 36c
" Boiler length ... 38c
Bolt ... 28c

Braziers' Sheets.—
30x60, 6 to 7 lbs ... ℘ ℔ 34c | 30x60, 10 to 12 lbs ... ℘ ℔ 30c
30x60, 8 to 9 lbs ... " 30 | 30x60, 15 to 100 lbs. " 28c

Solder.—F. S. & Co.'s make
Best Fine ... 15c
No. 1 ... 14c
Roofing ... 12c
Braziers or Spelter Solder ... 30c
Antimony ... 16c
Babbit Metal—F. S. & Co.'s ... 14c
No. 2 ... 10c

Sheet Iron.—

	Common.	Smooth. Com.	Smooth Charcoal.	Smooth Juniata
No. 24	3·20c	4·20c	6 c	8 c
25 & 26	3·40c	4·40c	6½c	8¼c
27	3·60c	4·60c	6½c	8½c

Galvanized Iron.—dis 35 %
No. 16 to 20 ... 12c | No. 27 ... 15c
21 to 24 ... 13c | 28 ... 16c
25 & 26 ... 14c

Russia Iron.—
Perfect ... 12c | No. 1 Stained ... 11c
In Sheets, 1c. higher.

American Russia.—
A ... 11c | B ... 9½c
in sheets, 1c higher

Lead.—
Pig ... 6 c | Lead Pipe, in full coils 6¼
Bar ... 6½ | Lead Pipe, when cut ... 6¾
Sheet Lead ... 6¾

Wire—Bright ... dis 50 %
Coppered ... dis 45 %

H. PRENTISS & CO.,
Sole Manufacturers of
GODDARD'S PATENT-RELIEVED
Machinists' and Gas Fitters'
TAPS,
AND SOLID REAMERS,
AND DEALERS IN
Machinists' Supplies.
E. A. GODDARD,
Late N. Y. Tap & Die Co.,
General Sales Agent, *14 Dey Street, New York.*
Send for Price List.

BROWNING'S
Patent Self-Adjusting Pipe Tong,
Wrench and Ratchet Drill.

This tool is made on an entirely new principle, and is pronounced superior to any tool made for the purpose.
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Manufacturer, 2554 Callowhill St., Philadelphia.

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Machines, Tools, Axles, Springs, Carriage Hardware, Carriage Woodwork, Hubs, Spokes, Felloes, Rims, Shafts, Poles, Hardwood Lumber,

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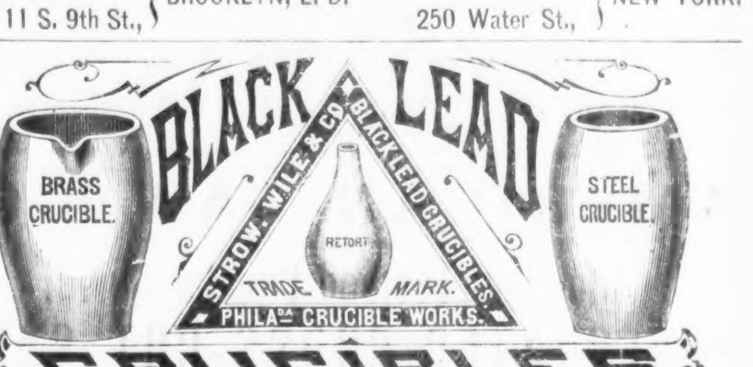

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PURE OAK TANNED LEATHER BELTING
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C. W. ARNY, - *148 N. Third St., Philadelphia, Pa.*

WM. F. FOREPAUGH, Jr., & BROTHERS,
TANNERS.
Also, Manufacturers of Superior Oak Tanned
LEATHER BELTING.
N. W. Cor. Randolph and Jefferson Sts., PHILADELPHIA.
All Belts warranted. Orders by Post immediately attended to.

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Morse Patent Straight-Lip Increase Twist Drill,
Beach's Patent Self-Centering Chuck, Solid and Shell Reamers.
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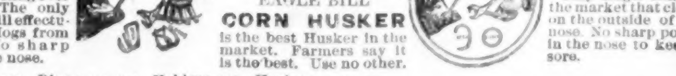
Drills for Coes, Worcester, Hunter and other Hand Drill Presses. Beach's Patent Self-Centering Chucks, Center and Adjustable Drill Chucks, Solid and Shell Reamers. Drill Grinding Machines. Taper Reamers, Milling Cutters and Special tools to order.
All Tools exact to Whitworth Standard Gauges.
GEO. R. STETSON, Supt. EDWARD S. TABER, Treas.



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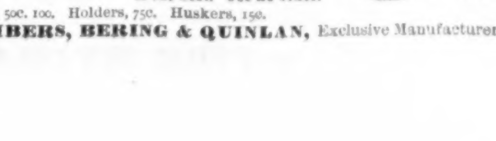
HOG RINGER
RINGS and HOLDER.
Only double Ring ever invented. The only Ring that will effectually keep Hogs from rooting. No sharp points in the nose.



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CORN HUSKER
Is the best Husker in the market. Farmers say it is the best. Use no other.

BROWN'S
HOG AND PIG
RINGER and RINGS.
Only single Ring in the market that closes on the outside of the nose. No sharp points in the nose to keep it sore.

Ringers, 75c. Rings, 50c. 100. Holders, 75c. Huskers, 15c.
CHAMBERS, BERING & QUINLAN, Exclusive Manufacturers, Decatur, Ill

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MFG. CO.,
MIDDLETOWN, - - - - NEW YORK.

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WARRANTED CAST STEEL

SAWS

Of every description, including

Circular, Shingle, Cross-Cut, Mill, Hand,

WOOD SAWS, Etc., Etc.

Harvey W. Peace, Vulcan Saw Works.

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TRADE MARK. HARVEY W. PEACE & Co.

Circulars, Cross-Cuts, Mill Mulay, Gang, Hand and Butcher. Molding and Planing Knives. Plastering Trowels, Mitering Rods, &c.

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AMERICAN SAW CO.,

Manufacturers of

Movable Toothed Circular Saws,

PERFORATED CROSS-CUT SAWS

And SOLID SAWS of all kinds. Trenton N. J.

GOLD MEDAL
Non-Extensible Razor Belt.

PATENTED JULY 25, 1871.

RE-ISSUED MAY 13, 1873, and JUNE 9, 1874.

In this Strap the liability of the leather to stretch and become loose and porous is prevented by the use of a patented non-extensible base, which supports the leather and secures

PERMANENT ELASTICITY.

We make this style with single rod, double rod, and wood frames, and intend that 1 shall, in quality compare favorably with our other well known brands.

BENJAMIN F. BADGER & SON, Manufacturers,

Badger Place, Charlestown, Mass.

MICROMETER CALIPER,

Made by THE VICTOR SEWING MACHINE CO,

Middletown, Conn.

This attractive and very desirable tool will be found more reliable and convenient than the Vernier Caliper, and to Machinists and Tool makers it is indispensable on work requiring very accurate and close measurement. Its capacity is one inch, and is graduated to one thousandths, but can readily be set one-half and quarter thousandths; and is so constructed that any wear resulting from use can be readily adjusted.

THE MACKENZIE PATENT CUPOLA & BLOWER.

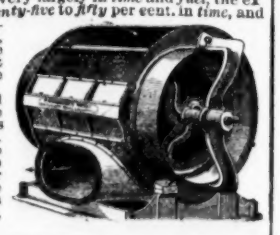
Send for circular to

Smith & Sayre Mfg. Co.,

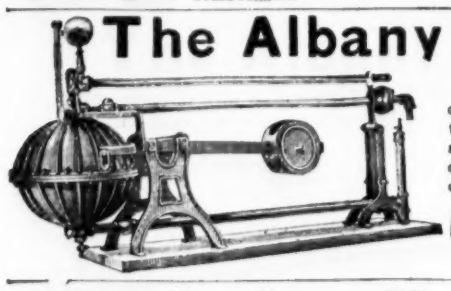
PROPRIETORS, 21 Cortlandt St., New York.

This Cupola has made a great revolution in melting Iron. It differs from all others in having a CONTINUOUS TUYERE, or in other words, the blast enters the fuel at all points. Above one ton capacity per hour, they are made *oval in form*. This brings the blast to the center of the furnace with the *least resistance* and *smallest* possible amount of power, and in combination with the continuous Tuyere causes complete diffusion of the air throughout the furnace, and uniform temperature, melting *ten or fifteen tons* an hour with the pressure of blast required to melt *two* or *three tons* in an ordinary Cupola. It also enables us to save very largely in *time* and *fuel*, the experience of our customers showing a gain of *twenty-five to forty* per cent. in *time*, and *twenty-five to forty* per cent *fuel* over the ordinary Cupola, and a BETTER QUALITY OF CASTING, especially in light work. This is due to the thorough diffusion of the air, and more perfect combustion, extracting less carbon from the iron, making a softer and tougher casting.

We manufacture these Cupolas of any desired capacity, numbered from 1 to 20, inclusive, the numbers indicating the melting capacities in TONS PER HOUR—No. 1, one ton; No. 2, two tons; No. 3, three tons per hour, and so on up to 15 or 20 tons. We have *improved* the *construction* of these Cupolas in every way, have increased their strength and durability, and sought to make them as convenient for working and repairs as our own, and the experience of our customers, could suggest.



The Albany Steam Trap



This Trap automatically drains the water of condensation from ***Heating Coils,*** and returns the same to the Boiler *whether* the Coils are *above or below* the water level in Boiler, thus doing away with pumps and other mechanical devices for such purposes. Apply to

Albany Steam Trap Company,

Albany. N. Y.

Ludlow Valve Mfg. Co.,

OFFICE AND WORKS:

938 to 954 River St. & 67 to 83 Vail Ave., Troy, N. Y.,

VALVES

(Double and Single Gate, ¾ in. to 48 in.—outside and inside Screws, Indicator, &c. for Gas, Water and Steam. Send for Circular.

Also FIRE HYDRANTS.

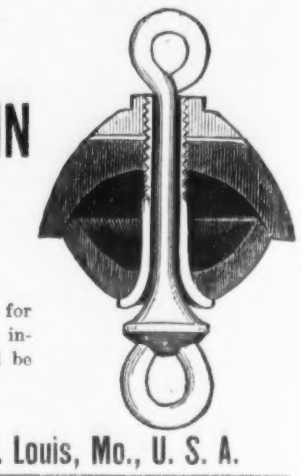
L. M. RUMSEY & CO.,

SOLE OWNERS AND MANUFACTURERS OF

Witherell's and Churchill's Patent

RUBBER BUCKETS, PUMP CHAIN AND FIXTURES

For Chain Pumps.



These Patents cover the use of the Rubber, the use of the Nut and Bolt for expanding, the use of the Tube and Valve for draining. All others are infringements, and manufacturers and dealers in infringing Buckets will be prosecuted to the full extent of the law.

For Rubber Buckets, Chain Tubing, Curbs and Fixtures, address

L. M. RUMSEY & CO., 811 North Main Street, St. Louis, Mo., U. S. A.

THE AMERICAN MACHINE COMPANY, Philadelphia, Pa.

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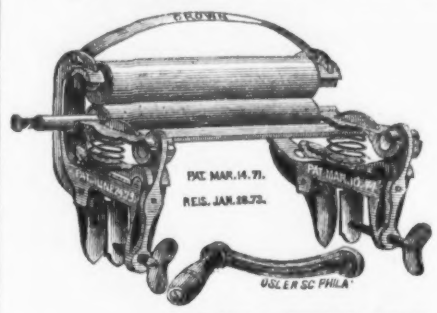
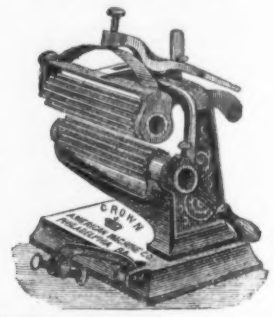
SPECIALTIES OF LIGHT IRON WORK.





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with Patent White Rubber Rolls, Galvanized Malleable Iron Frame Work, Bessemer Steel Springs, &c. Noted for Strength, Durability, Efficiency and Simplicity.

No. 2, Rolls 1⅝ in. diam., 10 in. long. No. 2½, Rolls 1¾ in. diam., 12 in. long.
No. 3, Rolls 1⅞ in. diam., 12 in. long. No. 4, Rolls 2 in. diam., 12 in. long.

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with valuable improvements over other style Machines, Patent Spring Arrangement and Clamping Device. Noted for Superiority of Finish and Practical Advantages. The leading Machine in the market.

Sizes (length of Rolls), 4½ inch, 6 inch and 8 inch.
Rolls with 10, 12, 15, 18, 22, 26 and 30 flutes.

THE EAGLE ANVIL!! WARRANTED!!

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These Anvils are *superior* to the best English, or other Anvils, on account of the peculiar process of their manufacture (invented and used only by this concern) and from the quality of the materials employed.

The best English Anvils become hollowing on the face by continued hammering in use, on account of the fibrous nature of the wrought iron—causing it to "settle" under the face.

The body of the Eagle Anvils is of crystallized iron, and no settling can ever occur; the steel face, therefore, remains perfectly true. Also, it has the great advantage, that being of a more *solid* material, and consequently with less rebound, the piece forged receives the full effect of the hammer, instead of a part of it being wasted by the rebound, as of a wrought iron anvil. An equal amount of work can, therefore, be done on this Anvil with a *hammer one-fifth lighter* than that required when using a wrought iron anvil.

The working surface is in *one piece* of JESSUP'S BEST TOOL CAST STEEL, which, being accurately ground, is hardened and given the proper temper for the heaviest work. The *horn* is covered with and its extremity made *entirely of steel*. The body of the Anvil is of the strongest grade of American iron, to which the cast steel face is *warranted to be thoroughly welded and not to come off*.

Price List, October 1st, 1876. ANVILS weighing 100 lbs. to 800 lbs., 9c. per lb. Smaller Anvils, ("Minims.")

No.	00	0	1	2	3	4	5	6	7	8	9
Weighing about	5 lb.	10 lb.	15 lb.	20 lb.	30 lb.	40 lb.	50 lb.	60 lb.	70 lb.	80 lb.	90 lb.
	$2·25	$2·75	$3·25	$4·00	$4·50	$5·25	$6·00	$6·50	$7·25	$8·00	$8·50

N. B.—These are the RETAIL PRICES. The only additional cost will be the freight to the purchaser's place of residence.

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FISHER & NORRIS, Sole Manufacturers, Trenton, N. J.

Patent Portable Hoisting Machines

PRICE LIST.

To Lift.	To Raise.	Price.	Ex. Ft.
8 ft.	500 lb.	$22 50	$1 00
8	1,000	25 00	1 20
8	2,000	30 00	1 50
8	3,000	40 00	1 75
9	4,000	60 00	2 00
10	6,000	75 00	2 20
10	8,000	95 00	2 40
12	12,000	140 00	3 75
12	16,000	225 00	4 75
12	20,000	300 00	6 00

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Twiss' Vertical Steam Engine,

For all light, quick work.

Sizes 2 to 20 horse power. Very compact and simple in design. Well made, easily kept in order, and occupies small space.

CHEAPER BY ONE-THIRD

than any other of as good quality and equal power.

Also, SPECIAL YACHT ENGINES.

NELSON W. TWISS, Haven, Conn.

JAMES HENSHALL,

Engineer, Machinist & Blacksmith,

Nos. 1114 & 1116 Beach Street,

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Drawings made to order. Repairing of all kinds promptly attended to. Blacksmithing executed in all its branches.

FIRE HYDRANTS

AND

Eddy Valves.

All Styles and Sizes.

Made (and patents owned) by

THE

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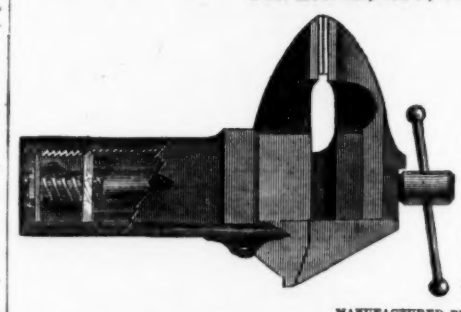

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Swivel and Coachmakers'

VISES.

The Best Rapid Adjustable Vise in the Market.

Simple and durable. No chance of getting out of order. No toggle or cam movements or parts. A trial will convince.

MANUFACTURED BY THE

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Steam Gauges, Belting, Chucks, Drills, Packing, Governors, Jacks, Oil Cups.

STEAM PUMPS for Pumping, Fire Purposes, and Boiler Feeding.

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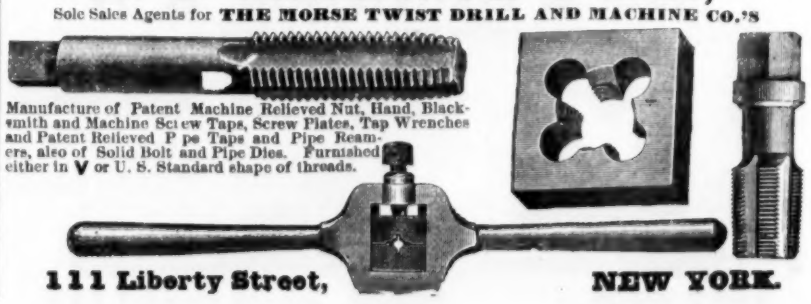
Sole Sales Agents for **THE MORSE TWIST DRILL AND MACHINE CO.'S**



Manufacture of Patent Machine Relieved Nut, Hand, Blacksmith and Machine Screw Taps, Screw Plates, Tap Wrenches and Patent Relieved Pipe Taps and Pipe Reamers, also of Solid Bolt and Pipe Dies. Furnished either in V or U. S. Standard shape of threads.

111 Liberty Street, NEW YORK.

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Reported by Macomber, Bigelow & Dowse, 156 to 164 Oliver St.

Anvils.—"Eagle American".....per lb. 9c: dis 20 %
Anvils and Vises (combined).
No. 1, $4·50; 2, $5·75; 3, 3·00 each, dis 25 %
L'Hommedieu Shib.....dis 15 %
Axes.—Blue Jacket..... 9 00
Racer..... 8 00
Red Cross, Handled..... 10 50
" " Boy's..... 9 00
Blue Jacket " " 10 00
Axe Handles.—Wadleigh's Oak—
A Extra, $2·50. B (No. 1) $2·00. C (No. 2) $1·50 ₩ doz
Blind Hinges.—Orr or Washburn's..₩ hun d sets $6 50
Blind Fasts.—
Orr or Washburn's.....per hundred set $4 50
Bolts.—Carriage, Phila.....dis 60&20 %
Carriage Common.....dis 75 %
Borax.—Best Refined.....₩ lb 10c
Borers.—Angle. Backus'.....dis 30 %
Boring Machines.—Angle.....each $4 50
Common. Snell's quality.....each 3 50
Braces.—Barber's..... dis 40&5 %
Backus'.....new list 50&10
Spofford's.....dis 50 %
Bracket
Saw Frames, with patterns complete.....₩ doz $5 50
Saws..... " 88
Star Bronzed.....new list net
Star Japanned.....new list net
Store Shelf.....new list net
Brass Faucets.—L. F. & C.....dis 60 %
Brushes.—Horse, Patent Metallic.....per doz. $4·50
Butts.—Union Drilled Loose Joint.....dis 66⅔ & 10%
" " Wire Fast Joint..... dis 50&10 %
" " Acorn Loose J't.....dis 65&10 %
Brass Butts.....dis 30 %
Wrought Table Butts and Back Flaps
.....revised list, dis 35 %
Wrought Narrow Butts.....reduced, dis 40 %
Cards.—
Curry Cards No. X, per doz., $0·55. .....dis 30 %
Horse No. X, " 0·80.....dis 30 %
Wool No. 3X, " 2·50.....dis 15 %
Cotton " No. 10, " 3·50.....dis 10 %
Cartridges.—U. S. Cartridge Co.....dis 60 %
Chisels.—"Buck Bros." Shank Goods.....dis 50 %
Socket.....dis 20 %
Compasses and Dividers.—Bemis'.....dis 40 %
P. S. & W.....dis 30 %
Cordage.—Manila (usual trade dis.).....₩ lb 12½c
Corn Hooks.....per doz $2·75
Crow Bars.—Solid Steel.....₩ lb, 9c
Cow Ties.....dis 30 %
Dividers.—Cook & Nickel Plated.....dis 15 %
Door Springs.—Mosseley—

Per doz.	$9·00	12·00	15·00	18·00	24·00
No.	0	1	2	3	4

Torrey's.....$2·50
Gem.....dis 10 %
Emery.—Aiden.....₩ lb 7c
Wellington Mills.....₩ lb 10c
Files.—American.....dis 35 %
Nicholson, new list.....dis 35 %
Wheeler, Madden & Clemson.....$5 to $; 10 %
Stubb's Tapers, genuine, 3 in., $1·50; 3½, $1·60, $1·66; 4½, $2·13; 5, $2·50
Hammers.—Maydole—new reduced list.....dis 15 %
M., B. & D., solid cast steel, adze eye, No. 1, $10; 1½, $9·25.....dis 25 %
M., B. & D., solid cast steel, belt face, No. 1 $11; 1½, $9·75.
Hammond—new reduced list.....dis 15 %
Gaugers & Rollers.—Anti-Friction.....dis 40 %
Climax.....dis 40 %
Acme Rollers.....dis 40 %
Hatchets.—Underhill Edge Tool Co.....dis 25 %
C. F. Dowse, warranted Cast Steel—
Shingling.....0, $4·75; 1, $5·25; 2, $5·75
Claw.....1, 5·75; 2, 6·25
Lathing.....1, 5·50
Axe Pattern.....1, $7·00; 2, 7·50
Broad....0, $5·75; 1, $6·50; 2, $7·50; 3, $9·25; 4, $10·75
5, $12·75; 6 $14·75
Hinges.—Strap and T Stanley Works.....dis 60&12½ %
Plate, Loose and Fast Joint.....₩ lb 5c
Wrought Screw Hook.....₩ lb 5c
Knobs.—Imp. Extension Silvered Glass.....₩ doz $8·00
Lanterns.—Tubular No. 0.....$10·00
Guarded, No. 74, (with kerosene oil and candle burners).....5·50
Lead.—Sheet, 6½c.; Pipe, 6c.....dis 10 %
Locks.—Norwalk Lock Co.....dis 50 %
Mattocks.—
K. P. & Co. axe finish, long cutter.....$10 00
Short cutter.....9 50
Pick.....10 00
Meat Cutters.—"Miles's" Challenge.....dis 50 %
No. 1, $22·00; 2, $30·00; 3, $40·00.
Metal.—Babbitt.....No. 1, 35c; 2, 25c; 5, 15c ₩ lb
Nails.—100 and larger.....$2 50
Nail Pullers.—Little Giant—Small.....per doz., $2·00
Little Giant—Large..... " 30·00
Padlocks.—Wilcox.....dis 33⅓&5 %
Picks.—K. P. & Co., Solid Eyes.....5 to 6 6 to 7
$7 50 $8 00
Pins.—Universal Hatand Coat all wood—
2 in.....₩ gross $2·50; 3 in., 3 50; 4 in., 4 50—dis 15 %
Pinaces.—Auburn Tool Co.....dis 50 %
N. Y. Tool Co.....dis 50 %
Plated Ware.—Rogers Bros.....dis 40 %
Pocket Knives.—Conn. Cutlery Co.....new net list
American Shear Co.....dis 40 %
Plumb & Levels.—Stanley.....dis 60&10 %
Pulleys.—Axle.
Fr'me pol, wh'l pt. face, No. 15, ¾ in., 30c.; 16, 2 in., 26c.
Pol. wh'l br'zed face No. 115, 1¼ in., 40c.; 116, 2 in., 36c.
Pulley Blocks.—"Best Boston Make".....ne
Rail Karn Door.—For Novelty and Anti-Friction Hangers.....per foot 7c., dis 40 %
Refrigerators.—Heinz Patent.....dis 25 %
Rivets.—Black.....dis 40 %
Carriage, oval head, Nos. 3, 4, 5, 6, 7, 8, dis 30 %
13 13 14 14 15 16c ₩ lb
Sad Irons.—Bliss & Drake.....₩ lb 2¾c
Sand Paper.....dis 15 & 5 %
M. B. & D.....0 to 2, $4·25; 2 to 3, $4·75
Saws.—*Hand and Panel*—
X Cut, Wheeler, Madden & Clemson.....per ft., 40c
" Champion..... " 40c
" Lightning..... " 45c
" Great American..... " 50c
Wood Saws, Welsh & Griffith.....₩ doz $14·00
Wheeler, Madden & Clemson's, same list as "Diston's".....dis. 20 %
Diston's.....dis. 20 %
Saw Horses.—Extra.....₩ doz $2·25
Folding..... " 3·50
Screws.—Am. Screw Co., new list Sept. 1st.....dis 60 %
Aiken's.....dis 60 %
Scythe Stones.—
"Willoughby Lake," first quality.....₩ gross $4·50
" " second quality..... " 3·00
Shovels.—O. Ames.....dis 32½ %
M. B. & D.....dis 33⅓ %
Spading Forks.—W. C. & Co., new list.....dis 15 %
Tools.—Aiken's Pattern.....₩ doz $5·00
Aiken's Genuine, $12.....dis 40&10 %
" " Saw Sets, $15.....dis 40&10 %
" " Pocket Wrenches, $8.....dis 50&10 %
Traps.—Oneida.....dis 30 %
Blake's.....dis 50 %
Vises.—K. P. & Co.'s Solid Box. Blacksmith...₩ lb 10½c
Parker's Parallel.....dis 10 %
Backus.....dis 25 %
"Howards," Parallel.....dis 25 %
Wardrobe Hooks.—Wire to drive.....₩ gross $1 00
Weights.—Cingow Weights.....₩ lb 1½c
Wedges—Axe.....₩ doz 30c
Wire.—
Eureka in spools, No. 28 to 40 assorted...₩ gross $3 50
Wire Netting.—Clinton Wire Cloth Co., Green. 3½c
Drab or Black.....₩ ft 3½c
Wrenches.—A. G. Coes & Co.....dis 50&10 %
"Girard".....dis 50, 10&10 %
Agricultural.....No. 10, $3·00; 14, 4·00, net
Wringers.—
Universal XX No. 2.....₩ doz $63 00; 2½, 60 00
Novelty, No. 10.....₩ doz 60 00
" No. 2..... " 63 00
" No. 22..... " 67 00
Excelsior.....A, $84 00; B, 92 00; CC, 114 00 ₩ doz
" E, set tubs..... ₩ doz 66 00
Eureka..... " 54 00
Witmington, Cooley & Co.—Hoes, Rakes, Forks, &c. dis 40 %. Special rate for Export.

ST. LOUIS.

Corrected weekly by Semple & Birge Mfg. Co

Animal Pokes.....$6·50 ₩ doz. net
Apple Parers.—Conqueror.....₩ doz $6 75
Hudson's Rotary..... " 6 75
Axes.—Wm. Mann's, Red Warrior.....₩ doz 9 50
"C. Marshall"..... " 9 00
Handled..... " $3 extra
Double Bitted..... " 19 00
Hunt's..... " 12 00
Axles.—"Jones, Henry & Co.'s" Patent Lubricating, Half Patent. Swelled Taper, Plain Taper and Concord Axles.....dis 35 %
Common Axles (Pat. Lubricating), 1⅛ inch and upward.....₩ lb. 5½c
do. less than 1⅛ inch..... " 5¾c
Babbitt Metal.—
Nos..... 4 3 2 1 A 1 Genuine.
9⅝ 11 16½ 20 33 34c ₩ lb.
Bellows.—best St. Louis make, new list.....dis. 15 %
Bells.—Troy, Church, School and Farm Bells..₩ 2 50c
"Improved Amalgam Bronzed" 15 in., $7·00; 17 in., $9·50; 19 in., $4; 21 in., $5; 24 in., $14
Belting.—"Boston Belting Co.'s" Rubber.....dis 50&10 %
Bradford & Sharp's" Oak-Tanned Leather.....dis 35 %
Blue Grass Strippers.—Hand Machines ₩ doz $27 00
Boilers.—Farmer's Profit Feed Boilers.....dis 30 %
" Caldrons.....dis 25 %
" Sugar Kettles.....dis 30 %
Belting Cloth.—New gold list.....net
Bolts.—Arms. Bell & Co.'s Carriage & Tire.....dis 75 %
Broadcast Seeders.—Cahoons Patent Hand dis 25 %
" " Power dis 30 %
Buggies.—Favorite Corduroy finish.....$110 00
" Leather " 115 00
" " & top.....140 00
Churns.—Julien, No. 4, $7·00; No. 3, $7·50; No. 2, $9·50.....dis 25 %
Cider Mills.
Buckeye Senior $27·00. Buckeye Junior, 18·00.....net
Coffe Roasters.—Sperry's.....dis 20 %
Corn Stalk Cutters.—"Perkin".....dis 20 %
Corn Drill.—"Campbell".....$19 00
Corn Knives.—Dunn Edge Tool Co.'s Chp...₩ doz 4 50
Seymour Mfg. Co.'s Solid Steel Back..... " 4 50
Corn Planters.—"Champion" Horse.....$44 00
"St. Louis" Hand....₩ doz $12 00
Corn Shellers.—Sandwich Mfg. Co.'s—
Power Shellers.....dis 10 %
Hand Shellers.....Special rates
Cotton Gins.—Carver, with 10 in. Saws, $6·25 a saw, net
12 in. Saws, $4.00 a saw.....net
Cultivators.—"Buckeye" 4 shovel.....3 " .$29 25
Crow Bars.—Steel Pointed.....₩ lb 6c
Drag Saw Machines.
Culver's Iron Drag Saw.....dis 20 %
Excelsior Drag Saw with Log Trucks.....dis 20 %
Fanning Mills.—Nash & Cutts.....dis 25 %
Feed Cutters.—Burdick National.....new list, net
Sanford No. 1, $9 25; No. 2, $7 25.....net
Bowman's Lever Cutter, $6·25.....net
Files.—Black Diamond, Mill.....dis 30&5 %
" Bastard.....dis 30&5 %
" Taper.....dis 30&5 %
Forges and Blowers.
Keystone Portable Forge Co.'s.....dis 15 %
Forks and Hoes.
Auburn Mfg. Co.'s Hay and Manure Forks
New list.....dis 15 %
Auburn Mfg. Co.'s Handled Hoes..new list, dis 15 %
Garden Seed Drills and Wheel Hoes.
Allen's Double Wheel Hoe.....new list, dis 20 %
" Planet Drill, Nos. 2 and 3.....new list, dis 20 %
" Combined Drill and Wheel Hoe " dis 20 %
Grain Register.—"Excelsior".....$13 00
Grinding Mills.—Challenge Feed Mills.....dis 20 %
Sedgebeer's Nonpareil Mills.....dis 20 %
Bradford's French Burr Mills.....dis 5 %
Osage Corn & Cob Mill.....$34 00
Handles.—No. 1 Fork, Hoe and Rake.new list, dis 25 %
No. 2 Fork, Hoe and Rake.....new list, dis 30 %
Ax, Pick, Sledge and Small Handles.....new list
Hand Carts.—"Champion".....dis 10 %
Hay and Cotton Presses.
Dederick's Ratiroad.....dis 10
" Perpetual.....dis 10
Hay Knives.
Dunn Edge Tool Co.'s.....₩ doz $12 00 ne
Lightning (Weymouth's Patent).....₩ doz $19 00
Horse Nails.—National Patent Pointed.....20c rate
National Patent Polished, extra finished.....25c "
Horse Powers.—Pitts or Carey's Patent.....dis 10 %
Wheeler's Railway.....dis 10 %
Sandwich Lever.....dis 10 %
Hose.—
Boston Belting Co.'s Rubber Medium Sizes.....dis 50 %
" " " S. Siz. Hydrant..dis 60 %
Ice Tools......new list net
Lawn Mowers.—Charter Oak & Auchidedlan dis 30 %
Money Drawers.—
Pierpont & Co.'s Excelsior.....per doz $33·00 net
Nails.—Wheeling Riverside Brand.....$2 55 rates
Packing.—Boston Belting Co.'s Rubber, Plain..dis 50 %
Boston Belting Co.'s Rubber, Pure.....dis 25&5 %
" " No. 1 Plain.....dis 40 %
" " Round and Square.....dis 40 %
Plows.—Avery's Cast and Steel.....new list, dis 30 %
Avery Sulky Plow.....new list, dis 25 %
Collins Cast Cast Steel.....new list net
Plow Sulky.—Buckeye.....$27 00 net
Post Hole Augers.—Clark's Patent—
No. 1, ₩ doz. $27; No. 2, $30; No. 3, $32.....dis 25 ₩
Pulleys.—5 inch.....per doz $3·70 net
4 inch.....per doz 2·50 net
Pumps.—St. Louis, Farm, Patent Metal Lined..dis 30 %
Rakes.—Advance Sulky.....each $4 00 net
St. Louis Reroiving 14 tooth.....4 15 net
" " " 16 " 4 65 net
" Hand Hay Rake.....per doz $4·50
Reaper Knives and Sections.—
Geo. Barnes & Co.'s Knives.....dis 40 %
" " Sections.....dis 40 %
Road Scrapers.—Steel.....each $8·00
Cast Iron.....dis 10c 5
Saws.—Curtis & Co.....dis 15 %
Scythes.—Dunn Edge Tool Co.'s.....dis 25 %
Shovels and Spades.—Groom Shovel Co...dis 40 %
Grain Scoops—Patent Cor'g Straps Groom Shovel Co.....dis 40 %, and 50c per doz extra
do. M. Rowland & Co., dis 30 % and 50c " "
do. O. Ames & Son dis 27½ % and 50c " "
Snaths and Cradles.—Seymour Mfg. Co.'s..dis 25 %
Sorghum Machinery.—Bell Cane Mills.....dis 30 %
Scantlin's Seamless Pans and Evaporators..dis 20 %
Springs.—Cleveland Spring Co. s—
Carriage and Express.....₩ bl c
Steam Engines.—Bookwalter.....dis 5 %
Trade.....dis 10 %
Mansfield.....dis 10 %
Thimble Skeins.—Whitewater's.....dis 40&10 %
Wheelbarrows.—Champion Iron Wheel.₩ doz $79·50
Champion Wood Wheel.....₩ doz 27·50
" Garden.....₩ doz. 39·00
Wagons.—Whitewater Farm Wagons—
Thimble Skein—
2¾ in, $66; 3 in. $67.50; 3¼ in. $70; 3½ in. $72
Wire Hate Ties.—Buckeye Double Twist.....net list
Dederick Adjustable.....new list, 1 25 %

St. Louis Metal Market.

(Corrected Weekly by Messrs. R. Selleck & Co.)

Tin Plate.

IC, 10x14, Best Char.	$ 7·00	DX, 12¼x17, B. Char.	$ 9·50
IX, 10x14, "	9·50	DXX, 12¾x17 "	12 00
IC, 12x12, "	7·00	DXXX, 12¾x17 "	14 50
IX, 12x12, "	9·00	IC, 20x28, "	17·00
IC, 14x20, "	7·00	IX, 20x28, "	21·00
IX, 14x20, "	9·00	IXX, 20x28, "	23·50
IXX, 14x20, "	12 00	IC, 14x20, Best Roof	6 50
IXXX, 14x20, B. Char.	14·50	IX, 14x20, "	9·00
IXXXX, 14x20. "	17·00	IC, 20x28, "	13 50
IC, 12x24, "	7·25	IX, 20x28, "	18 00
IC, 14x14 "	14·00	IC, 10x14, Best Coke	6 25
IX, 14x14, "	17·50	IC 14x20, "	6 25
IXX, 14x14, "	20·50	IC, 10x20, "	10·00
DC, 12¾x17, "	7·00		

Sheet Iron.	Com'n.	S L U D. Ref'd Sm'th.	Am'n Sm'th
No. 16 to 20	3	4c 5·1c	7 8c
No. 22 to 24	3	4c 5·2c	7 8c
No. 26	3·20c	4.3c 6·1c	8c c
No. 27	3·40c	4·4c 6·3c	8·2c

Genuine Russia Iron.
Perfect—No. 9, 10, 11, 12.....per lb. 12¾c
No. 1 Stained—No. 9, 10, 11, 12.....per lb. 12¾c
Tare 25 lbs. to Bdle. For less than Bdle. add 1c ₩ lb.
Patent Planished Iron.
No. 24 to 27, A quality.....per lb. 11c
" 18 " " 9¾c
For less than Bdle. add 1c. per lb.
Galvanized Sheet Iron.
Juniata, or 1st quality.....dis 40 %
Block Tin.

Banca, Large Pigs	32c	do. Small	30c
Straits, Large Pigs	29c	Bar	31c
Eng. Ref'd, Large Pig	29c		

Solder.

Extra in Bars	14c	No. 2, in Bars	11c
No. 1, in "	12c	Spelter Solder	24c
Pig Lead—Pigs	5c	In Bars	6c
Antimony			13c
Bismuth			$2 50
Nickel			2 50
Crucibles.—Dixon's			₩ No. 4c

Babbit Metal.

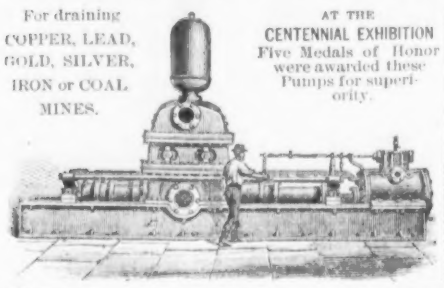
No. 1	₩ lb. 16c	No. 3	₩ lb 11½c
" 2	" 14c	" 4	" 7½c

Copper.
Brazier's, 30x60, 14 to 100 lbs. Sheets.....28c
" " 10, 11 & 12 lbs., " 30c
" " 8 and 9 lbs. " 32c
" " 6 and 7 lbs. " 34c
Tinned, 14x48, 14 and 16 oz.....30c
Planished, 14x48, 14 and 16 oz.....36c
" Boiler Sizes 14 and 16 oz.....38c
Gutter Copper, 20 and 24x72, 10, 11 and 12 lb. Sheets.....30c
" " 14 lb. Sheets.....28c
Reservoir Copper, 16x60 and 18x60.....30c
Bar Copper, Square and Round, ¼ to 1⅝ inch.....28c
" " ⅛ inch.....31c
Copper Bottoms.....30c
Soldering Coppers.....30c
Brass.
Roll, No. 10 to 28, 12 in. in width.....27c
" 30, 12 in. in width.....28c
" 32, 16 " 30c
" 34, 16 " 30c
" 36, 16 " 37c
Platers, No. 40, 6.....50c
Brass and Copper Wire.

	Brass.	Copper.		Brass.	Copper.
No. 0 to 20	32c	40c	No. 24	37c	47c
" 21	33c	43c	" 25	40c	50c
" 23	34c	44c	" 26	42c	52c
" 23	35c	45c	" 27	45c	55c

Brass Spring Wire, 2c. ₩ lb advance.
Brass Tubing.
Plain to No. 20.....45c | 5-16 inch.....33c
⅜ inch.....45c | ½ " 33c
Copper Rivets and Burs.....dis 10 %
Brass Kettles 7 to 13 inches.....₩ lb 35c.
" " all sizes over 13 inches.....40c.
Sheet Zinc.—600 lbs. cask.....7½c
250 lbs. cask.....7¾c
Sheet.....8½c
Wire.—Iron, Bright Market.....dis 50 %
Iron, Coppered Market.....dis 45 %
Fence, Nos. 7, 8 and 9.....₩ lb 4½c
Trellis, Nos. 10 and 11.....4¾c
" No. 12.....5¾c
Hay Baling, Charcoal, No. 10 and 11.....5¾c
" " No. 12.....5¾c
Broom, Tinned, Nos. 18 to 24.....11c
Fence Staples.....per keg 5½c
Per lb.....6 "
Iron Rivets.—Black, papered.....dis 25 %
Tinned, papered.....dis 25 %
In bulk.....new 3-16 ¼ 5-16 ⅜ in. diam.
11¾c 10¾c 10 c 9¾c per lb.
Sad Irons......₩ lb 3½c
Enameled Kettles.—Standard Mfg. Co.....dis 50 %
Enameled Sauce Pans.
Standard Mfg. Co.....dis 50 %
Enameled Boilers.—Standard Mfg. Co.....dis 40 %
Dripping Pans.—Smooth Iron.....₩ lb 9c
Geneva Fluters.....per doz $13 50
Monroe Fluters..... " 12 50
Stove Polish.—Dixon's.....per gross 6 00
Gem..... 4 50
Japanese..... 3 50
Dixon's, in bulk.....₩ lb 8c
Coffee Mills.—Parker's.....dis 20 %
Granite Iron Ware.....dis 75 %
Spoons.—New list.....dis 10 %
Retinned Iron Ware.....30 % off
Plain Stamped Ware.....30 % off
Japanned Ware.—St. Louis list.....dis 40&5 %
Fry Pans.....dis 50 %
Ears.....dis 50 %

Knowles' Patent Improved Mining Pumps.



For draining COPPER, LEAD, GOLD, SILVER, IRON or COAL MINES.

AT THE CENTENNIAL EXHIBITION Five Medals of Honor were awarded these Pumps for superiority.

Arranged with Special Reference to Working Water Containing Dirt, Gritty Matter or Acid.

Pumps of capacity of over one million gallons per day are now delivering water through 600 feet vertical column, working entirely without shock or jar, the entire stoppages of Pump aggregating less than twelve hours per year.

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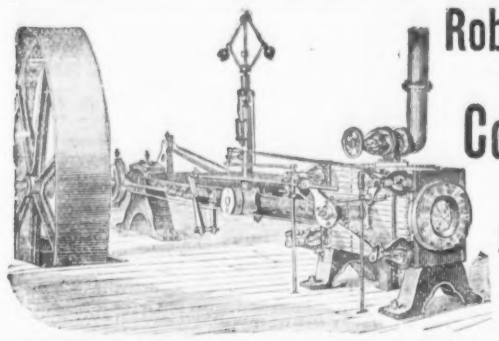

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Corliss Engine

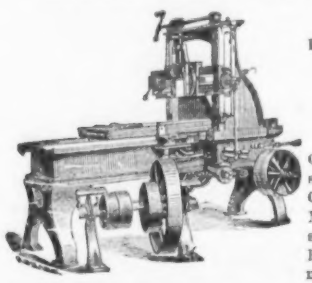
BUILDERS,

Shafting & Gearing,

Boiler Makers.

The Pratt & Whitney Co.,

Hartford, Conn.,



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Hammer's Malleable Iron Oilers.
Hammer's Mall. Iron Hand Lamps.
Hammer's M. I. Hanging Lamps.

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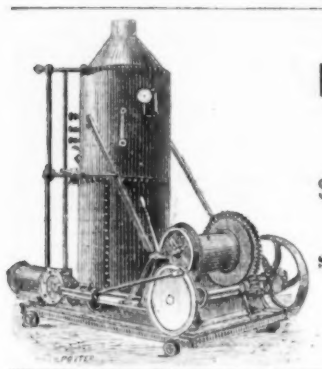

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Combined, as in cut, 2 to 12 H. P., or on independent beds, **2 H. P.** upwards to **200 H. P.** *Plain* or with *Automatic Variable Cut-off*. We can refer to hundreds in use, of all sizes, giving perfect satisfaction.

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For High or Low Pressure Engines.

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Prevents formation of scale. Removes old scale.
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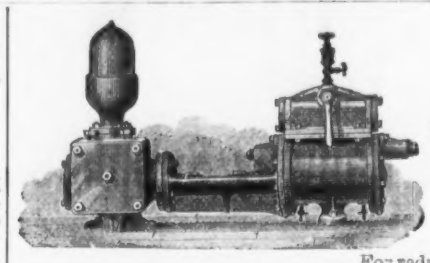

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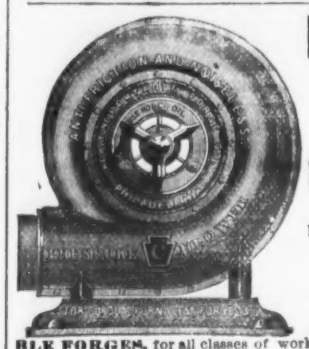

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All sizes for

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For Ventilating Mines, Buildings, etc.; Removing Dust, Shavings, etc.; Drying Wool, Lumber, etc. Every Blower Guaranteed. Send for circular, or call and see them in operation.

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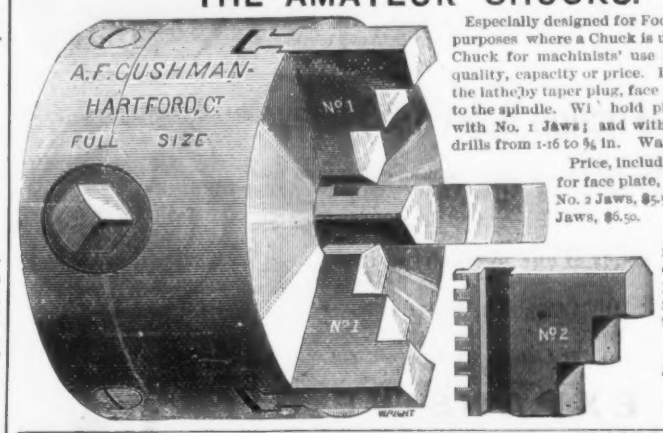

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Scales and Testing Machines.

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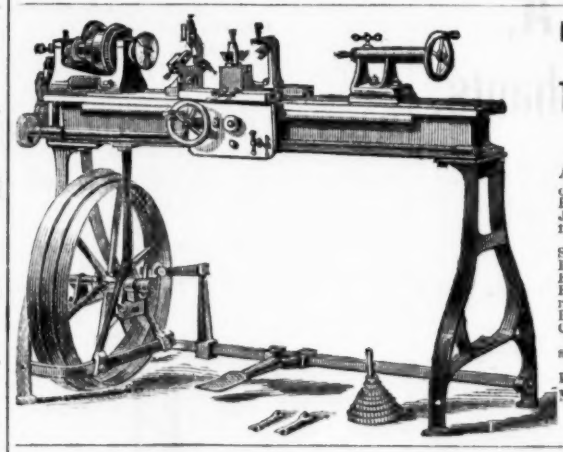

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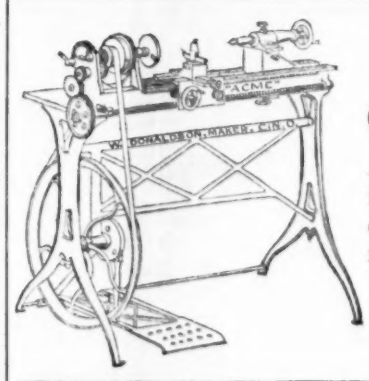

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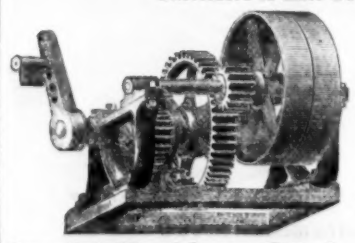

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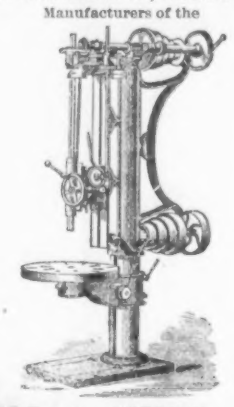

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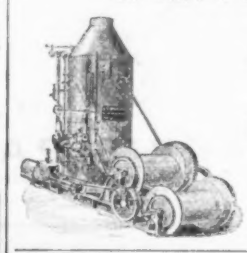

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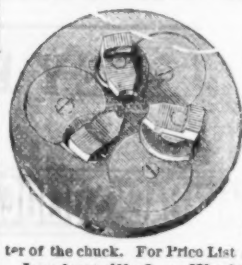

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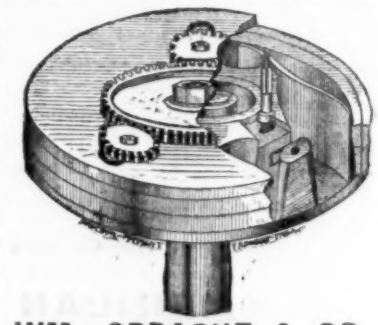

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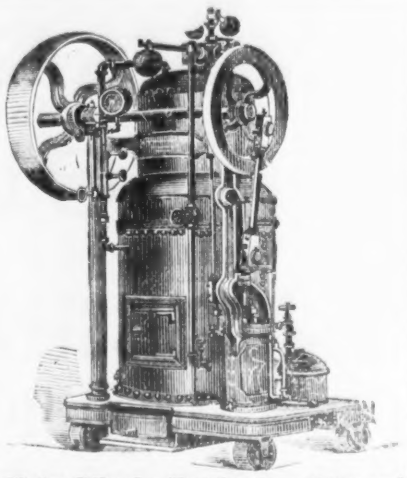

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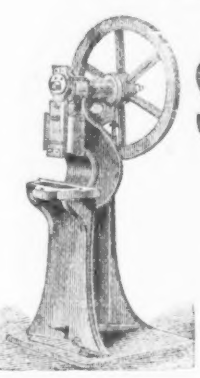

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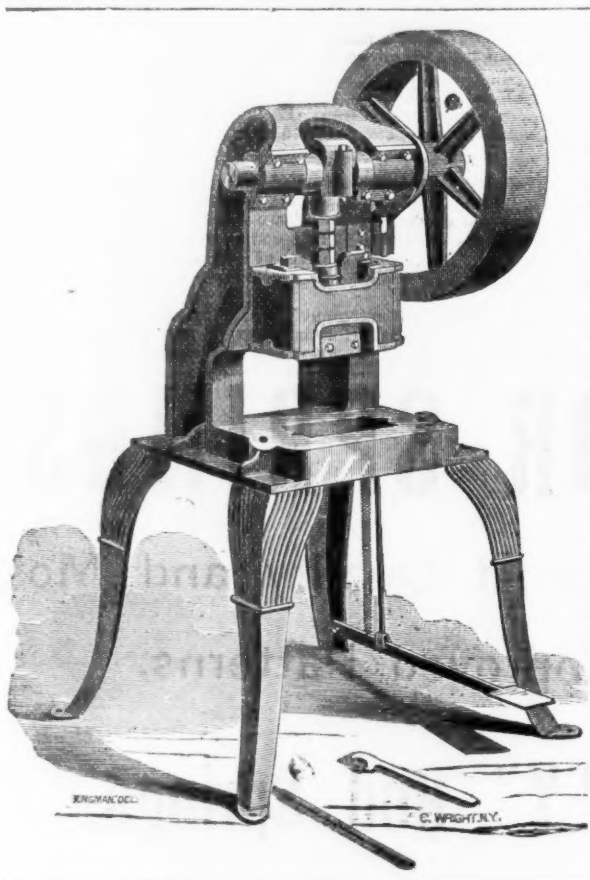

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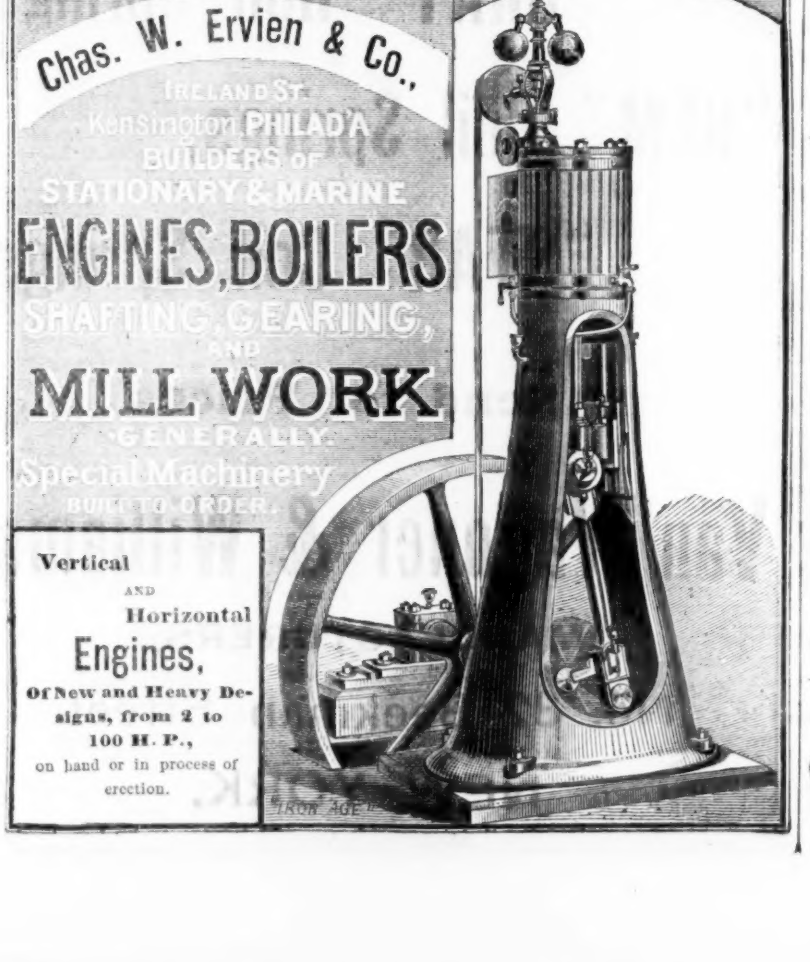

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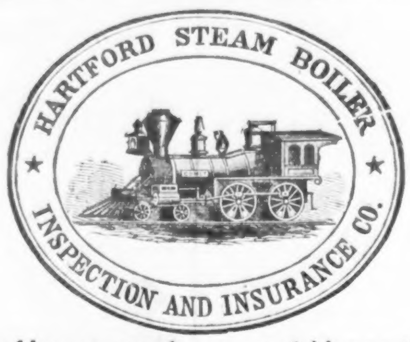

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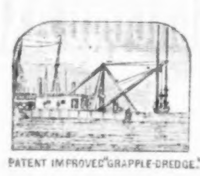

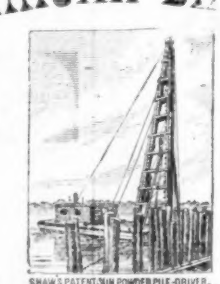

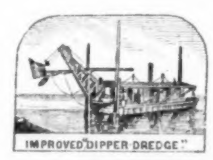

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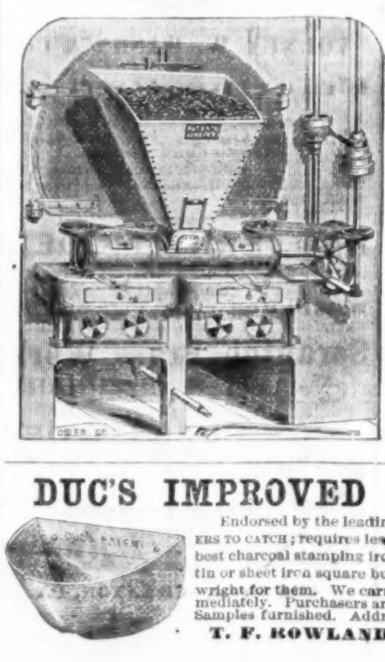

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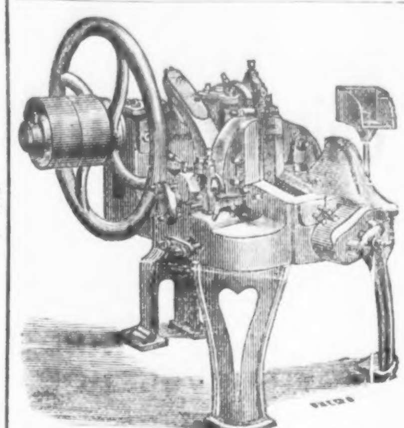

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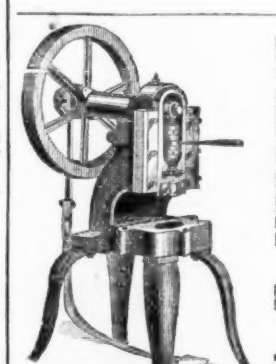

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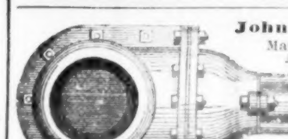

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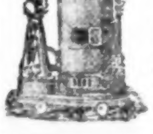

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